In the Matter of	)	
Country Code 1 ENUM, LLC	)	
Petition for Limited Waiver of	)	CC Docket No. 99-200
Section 52.15(g)(2)(i) of the	)	
Commission's Rules Regarding Access to	)	
Numbering Resources	)	

PETITION FOR LIMITED WAIVER

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I.   INTRODUCTION AND SUMMARY

Country Code 1 ENUM Limited Liability Company ("ENUM LLC"), a jointly owned

and managed affiliate of leading telecommunications and Internet industry participants,[1]

respectfully requests that the Wireline Competition Bureau grant a limited waiver of section

52.15(g) of the Commission's numbering rules to allow ENUM LLC to obtain numbering

resources directly from the Pooling Administrator (PA). ENUM LLC intends to use these

numbering resources in conjunction with a trial of ENUM technology within the Country Code 1

North American Numbering Plan.

II.   BACKGROUND

A.   The Need for Direct Access to Numbering Resources

In 2004, the telecommunications and Internet industries established ENUM LLC to create

the public infrastructure that will promote the development of electronic numbering, or ENUM,

technology in the countries of the North American Numbering Plan ("NANP").

ENUM allows users to combine the resources of the Internet with traditional telephony,

uniting the two diverse worlds of communications and enabling a new range of communication

applications. Specifically, ENUM is a mapping protocol that links the Internet and telephony

platforms through a single identifier. As such, it has the potential to facilitate convergence of

communications networks by linking e-mail addresses, telephone numbers, fax numbers, and cell

phone numbers for individuals or businesses. A global domain, e164.arpa, has been established

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[1] ENUM LLC members include GoDaddy.com, Sprint, BellSouth, AT&T, Inc., and Verizon. AT&T Inc. was formed by the recent merger of SBC Communications, Inc. and AT&T Corp. Both companies were founding members of ENUM LLC. Similarly, Verizon recently acquired MCI; both companies were also founding members of ENUM LLC.

for ENUM, and to date 32 member countries (not including the United States) have opted into the domain and begun to establish trials for provision of ENUM services.

The United States government is supportive of this work on ENUM technology, both internationally and domestically. The United States recognizes that ENUM, through the globally coordinated domain, may provide efficiencies and opportunities for global interconnectivity and the potential to facilitate convergence of communications networks that could benefit both industry and users.[2]

On September 30, 2005, ENUM LLC asked the relevant authorities in the United States and Canada to request the temporary delegation of the ENUM domain corresponding to Country Code 1 (1.e164.arpa) from the International Telecommunications Union to support an ENUM trial.[3] The trial is intended to allow those NANP member countries who have an interest in furthering their knowledge of ENUM to pursue that opportunity. The trial is intended to develop a practical understanding of how to create a commercial platform on which ENUM may be implemented within participating NANP countries, and to allow the participating countries, as well as providers within those countries, the opportunity to experiment with ENUM before deciding how to proceed to a permanent commercial platform.

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[2] Letter of Ambassador David A. Gross, U.S. Coordinator for International Communications and Information Policy, United States Department of State, to Karen N. Mulberry, Chairman, Country Code 1 ENUM LLC dated September 2, 2005, attached as Exhibit 1.

[3] Letter of Karen N. Mulberry, Chairman, Country Code 1 ENUM LLC to Ambassador David A. Gross, U.S. Coordinator for International Communications and Information Policy, United States Department of State, dated September 20, 2005, attached as Exhibit 2; Letter of Karen N. Mulberry, Chairman, Country Code 1 ENUM LLC to Mr. Michael M. Binder, Assistant Deputy Minister for Spectrum, Information Technologies, and Telecommunications, Industry Canada , dated September 20, 2005, attached as Exhibit 3.

The specific testing plans are explained in detail in the Framework Document attached as Exhibit 4. The technical and operational requirements for a Tier 1A Registry trial for Country Code 1 are specified in the technical requirements document attached as Exhibit 5. The trial will be strictly limited to non-commercial activities, and will be operated in an open, neutral, and transparent fashion. It is contemplated that a report of the trial results will be made publicly available, although the report will exclude those portions of individual participants' results that involve proprietary information. The trial will be operated in a manner that preserves national sovereignty, specifically the continued right of each country sharing Country Code 1 to determine if and how it chooses to participate in ENUM. Finally, the trial will be of limited duration.

With information gleaned from trial participants and the trial Tier 1A registry host,[4] ENUM LLC intends to issue a Request for Proposal to select a commercial vendor to implement a Tier 1A, or "Skinny Tier 1" as the foundation of the single, public ENUM system for Country Code 1 by hosting the NPAs of those countries that have authorized their inclusion.

The relevant U.S. and Canadian authorities submitted temporary delegation requests to the International Telecommunication Union in December 2005.[5] The United States government

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[4] In preparation for the trial, ENUM LLC has signed a Memorandum of Understanding with the Canadian Internet Registry Authority ("CIRA") to host the Tier 1A Registry. CIRA is a not-for-profit private Canadian corporation established in 1998 to be responsible for operating the.ca Internet country code Top Level Domain as a public resource. ENUM LLC concluded that CIRA's expertise with the .ca registry would be advantageous to the ENUM trials. The February 9, 2005 Memorandum of Understanding between ENUM LLC and CIRA is attached as Exhibit 6.

[5] Letter of Ambassador David A. Gross, U.S. Coordinator for International Communications and Information Policy, United States Department of State to Mr. Houlin Zhao, Director of the Telecommunication Standardization Bureau, International Telecommunication Union, dated December 1, 2005, attached as Exhibit 7; Letter of Mr. Michael M. Binder, Assistant Deputy Minister for Spectrum, Information Technologies, and Telecommunications, Industry Canada to

(footnote continued on next page)

set forth twelve conditions on the submission of its request to the International

Telecommunications Union.[6] ENUM LLC has formally committed to comply with all twelve of

the conditions.[7] Among the conditions with which ENUM LLC has agreed to comply are the

following:

> 4. Prior to the commencement of the trial, the ENUM LLC must apply to the Federal Communications Commission (FCC) for approval of an assignment of numbers from geographic Number Plan Areas (NPAs) in the U.S., for use in the U.S. ENUM trial. These numbers may be distributed appropriately to U.S. trial participants, but not to end users or consumers not affiliated with the trial participants. For example, trial participants may allow their employees to use the numbers on a temporary basis only. Use of any other U.S. numbers in this trial is prohibited.

> 5. The ENUM LLC is only permitted to apply for or use geographic numbers which have been approved by the FCC for the U.S. ENUM trial. Use of non-geographic numbers is prohibited.

ENUM LLC is submitting this waiver application in accordance with

conditions 4 and 5, listed above.

B.   47 C.F.R. § 52.15(g)(2)

ENUM LLC does not have the ability to obtain numbering resources directly from

NANPA and/or the PA. The Commission's rules provide that applicants for NANP numbering

resources must be "authorized to provide service in the area for which the numbering resources

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Mr. Houlin Zhao, Director of the Telecommunication Standardization Bureau, International Telecommunication Union, dated December 1, 2005, attached as Exhibit 8.

[6] Exhibit 1.

[7] Exhibit 2.

are being requested."[8] The rules also prohibit the NANPA from issuing numbering resources to entities without an Operating Company Number.

ENUM LLC is not itself a carrier, and does not have the facilities or interconnection normally required for number allocation. It would be very burdensome and likely prohibitive for ENUM LLC to acquire such facilities and interconnections. Rather, as described above and in the attached Exhibits, ENUM LLC was formed solely for the purpose of building an infrastructure that will be used by carriers (and end users) to provide communications services rather than to provide such services itself. Moreover, ENUM LLC requires access to number resources only on a temporary basis, for the limited duration of the trial. Thus, ENUM LLC requests waiver of 47 C.F.R. § 52.15(g)(2) to allow it to obtain temporary numbering resources for the trial.

III. DISCUSSION

A. There is "Good Cause" to Grant ENUM LLC's Petition for a Limited Waiver

The Bureau has discretion to waive a rule upon a showing of good cause.[9] Good cause exists where strict application of a rule would be inconsistent with the public interest in a particular factual circumstance. Stated differently, when waiver of a rule will serve the public interest, such a waiver is appropriate and permitted.

ENUM LLC's request is a unique circumstance that merits waiver of the general rule. As discussed above, ENUM LLC seeks only temporary access to numbering resources, and it would be exceedingly burdensome for ENUM LLC to acquire the facilities and interconnections

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[8] 47 C.F.R. § 52.15(g)(2)(i).

[9] 47 C.F.R. § 1.3.

necessary to establish itself as a carrier solely for the purpose of carrying out this technology trial of limited duration.

However, the National Telecommunications and Information Administration has determined that testing and implementation of ENUM technology will serve the public interest. Specifically, the NTIA has observed that the potential benefits of ENUM warrant expeditious action, that "the United States should seize this opportunity and take steps to participate in e164.arpa, consistent with the highest standards of security, competition, and privacy," and that "the United States should move quickly to address certain key preliminary issues regarding U.S. implementation of ENUM ...."[10] The United States Department of State has been similarly supportive of the plans for an ENUM trial, encouraging the members of ENUM LLC to proceed with their petition for a request for delegation from the International Telecommunications Union and with the planned trials.[11]

Granting a limited waiver of 52.15(g) would facilitate these policy objectives and would, moreover, support a critical general principal identified in the Communications Act – the promotion of new services and technologies with limited regulation, and the acceleration of private sector deployment of advanced telecommunications and information technologies to American consumers.[12]

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[10] Letter of Nancy J. Victory, National Telecommunications and Information Administration of the United States Department of Commerce, to The Honorable David A. Gross, U.S. Coordinator for International Communications and Information Policy, United States Department of State, dated December 12, 2003, attached as Exhibit 10.

[11] Exhibit 1.

[12] *1998 Biennial Regulatory Review – Testing New Technology*, CC Docket No. 98-94, Policy Statement, FCC 99-53 ¶¶ 3, 12 (1999).

For these reasons, the Bureau should expeditiously grant ENUM LLC's request for a limited waiver, which will allow ENUM LLC to efficiently and cost-effectively test ENUM technology for the purposes of developing a platform for commercial implementation of ENUM technology, and making it available to American consumers and businesses.

B. The Requested Waiver is Consistent with the Conditions Established by the United States Department of State and with the Commission's Numbering Resource Optimization Goals

Consistent with the conditions established by the United States Department of State and with the technical requirements of the planned ENUM trials, ENUM LLC requests that the Bureau direct the Pooling Administrator (PA) to assign at the direction of ENUM LLC some maximum number of new thousand blocks from Central Office codes already opened in the public switched telephone network for use solely in the trial. The Trial Participants Advisory Committee, consisting of trial participants who must sign a Memorandum of Understanding for an ENUM Trial in the United States (the "Trial MOU"),[13] will determine the rate centers in which numbering resources are required and the participating carriers that agree to host the corresponding blocks. Recommendations of the Trial Participants Advisory Committee will be reviewed by ENUM LLC and, upon approval, ENUM LLC will forward a request to the PA accompanied by a copy of the FCC waiver under which the blocks are being requested and a list of the rate centers and associated host carriers to which the blocks are to be assigned. The proposed procedures for block allocation and number assignment are detailed in Exhibit 11. ENUM LLC will at all times remain solely responsible for complying with the outlined procedures and the terms of any waiver.

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[13] The final form of the Trial MOU is attached as Exhibit 9. ENUM LLC will shortly begin executing copies of the Trial MOU with trial participants.

It is further anticipated that service providers will provision blocks in their own networks but will restrict number assignments from the blocks to bona fide trial participants, who will be subject to verification by ENUM LLC and will be required to agree to and to execute the ENUM Trial Memorandum of Understanding incorporating all terms and conditions established by the relevant federal authorities. The ENUM Trial Memorandum of Understanding prohibits participants from assigning trial numbers to non-participants, such as customers, tenants, or students.[14] Parties without a U.S. presence that wish to participate in the trial using U.S. numbering resources will be required to work through a participating entity that does have a U.S. presence.

Subject to the maximum allocation, if any, ordered by the Bureau in response to this Request, ENUM LLC will request new block assignments from the Pooling Administrator as additional participants or locations join the ENUM trial. Should blocks beyond the allocation sought in this Request be required, ENUM LLC will submit a supplemental waiver request to the Bureau. ENUM LLC proposes to submit monthly reports to the Commission regarding the current set of block allocations and number assignments in use in the trial. At the end of the trial all blocks will be returned to the Pooling Administrator.

With these proposed procedures, ENUM LLC represents that this waiver request will comply with conditions 4 and 5 to the United States government's submission of a delegation request to the International Telecommunications Union, and moreover complies with relevant Commission numbering resource requirements.

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[14] To optimize use of numbering resources, ENUM LLC, working through participating carriers, may in some instances assign individual numbers from trial blocks associated with a rate center other than that in which the participant is located. The public switched telephone network point

(footnote continued on next page)

C. **Expedited Basis**

The Commission has previously committed to review waiver requests on an expedited

basis when the requests concern technical and market trials, particularly trials designed to be of

limited scope and duration. The rationale for such a policy is that those developing and testing

new technology "should have the flexibility to design appropriate experiments based on the

unique circumstances posed by their various and different cases.[15]

The time-limited ENUM trial described in this Petition is the type of trial for which

expedited review is contemplated. Specifically, the delegation is for the limited duration of one

year, and commenced February 15, 2006. To get maximum use from the limited period of

delegation, ENUM LLC has made arrangements that will permit the trial to commence the week

of April 17, 2006. ENUM LLC would need to have access to numbering resources sufficiently

in advance of that date to ensure a smooth trial initiation and successful trial efforts.

Accordingly, in connection with the Commission's commitment to promote the rapid

development of new technologies and services, ENUM LLC respectfully requests expedited

review of this Petition.

IV. **CONCLUSION**

For all of the foregoing reasons, ENUM LLC respectfully requests that the Bureau

expeditiously grant a waiver of section 52.15(g) of its rules to allow ENUM LLC to obtain

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of interface for the block will always be appropriate to the rate center with which the block is associated.

[15] 1998 Biennial Regulatory Review – Testing New Technology, CC Docket No. 98-94, Policy Statement, FCC 99-53 (1999).

numbering resources directly from North American Numbering Plan Administrator and/or the

Pooling Administrator.

Respectfully Submitted,

By: /s/ Lino S. Lipinsky de Orlov_____
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EXHIBIT 1

United States Department of State

Washington, D.C.   20520

SEP 2 – 2005

Ms. Karen N. Mulberry
Chairman
Country Code 1 ENUM LLC
c/o McKenna Long and Aldridge LLP
1875 Lawrence St., Suite 200
Denver, CO 80202

Dear Chairman Mulberry:

I received the ENUM trial delegation informational package you sent noting that the ENUM
Country Code 1 LLC is pushing forward in an industry-led effort to implement ENUM in the
United States and Country Code 1. I wish to congratulate the LLC on the progress it has made
thus far. The United States Government has continued to be supportive of the work on ENUM,
both internationally and domestically, recognizing that ENUM, through a globally coordinated
domain, may provide efficiencies and opportunities for global interconnectivity and the potential
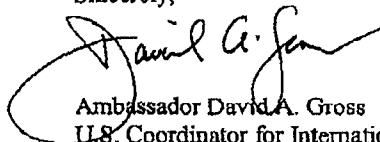to facilitate convergence of communications networks that could benefit both industry and users.

Because of the potential benefits associated with ENUM, the National Telecommunications
and Information Administration (NTIA) noted in its 2003 letter that the United States should
"seize this opportunity and take steps to participate in e164.arpa, consistent with the highest
standards of security, competition, and privacy." NTIA further outlined eight principles that
continue to form the policy basis for U.S. ENUM implementation (see attached letter).

It was based upon these principles that your informational package was reviewed by the
Department of State, the Federal Communications Commission (FCC), the NTIA, and the
Federal Trade Commission (FTC) and that the attached terms and conditions were developed.
These terms and conditions are designed to ensure the appropriate use of numbering resources,
the continued stability and security of the Internet and telecommunications networks, and the
protection of U. S. consumers' interests during the trial. Thus, in order for the U.S. Government
to approve the delegation for the U.S. ENUM trial, each of these terms and conditions must be
met. When formally requesting delegation for purposes of this trial, please provide written
assurances that each of these requirements are or will be met.

I encourage you to proceed with requesting the administrations of the various Country Code 1
countries to request the International Telecommunication Union (ITU) to temporarily delegate

the ENUM domain for Country Code 1 to the "Country Code 1 ENUM LLC" for the purpose of conducting an ENUM trial. I look forward to our continued cooperation on this important effort.

Sincerely,

Ambassador David A. Gross
U.S. Coordinator for International Communications
and Information Policy

cc: Chairman Kevin J. Martin, Federal Communications Commission
        Assistant Secretary Michael D. Gallagher, NTIA, Department of Commerce
        Chairman Deborah Platt Majoras, Federal Trade Commission

        Attachments: Letter from NTIA Assistant Secretary Victory
                      Terms and Conditions for a U.S. Trial of ENUM

Terms and Conditions for a U.S. Trial of ENUM

1. When requesting the delegation for purposes of a U.S. ENUM trial, the ENUM LLC shall provide a trial plan framework that details the concepts and technologies that will be tested during the trial period. (It is recommended that this trial plan framework should accompany the delegation request to each country).

2. Prior to the commencement of the trial, the ENUM LLC must submit a detailed trial plan to the U.S. Government. The ENUM LLC may modify the trial plan, but must notify the U.S. Government of the modifications before it implements them. The trial plan and any modifications thereto are subject to modification or rejection by the U.S. Government.

3. Prior to the commencement of the trial, the ENUM LLC must provide a copy of the administrative procedures for the delegation of the trial telephone numbers.

4. Prior to the commencement of the trial, the ENUM LLC must apply to the Federal Communications Commission (FCC) for approval of an assignment of numbers from geographic Numbering Plan Area's (NPA's) in the U.S., for use in the U.S. ENUM trial. These numbers may be distributed appropriately to U.S. trial participants, but not to end users or consumers not affiliated with the trial participants. For example, trial participants may allow their employees to use the numbers on a temporary basis only. Use of any other U.S. numbers in this trial is prohibited.

5. The ENUM LLC is only permitted to apply for or use geographic numbers which have been approved by the FCC for the U.S. ENUM trial. Use of non-geographic numbers in this trial is prohibited.

6. The ENUM LLC will not permit the testing of carrier or infrastructure ENUM in e164.arpa during the trial period.

7. The ENUM LLC will provide, at a minimum, a monthly progress report. These monthly reports must include a list of trial participants and numbers distributed to them, any proposed changes to the trial plan (see number 2 above) prior to implementation, and test failures and successes. The report should also identify any adverse impact the trial may cause to the networks or the Internet, and identify actions taken to preserve the security and stability of the Internet and telecommunications systems. It is also recommended that these reports also note tests, if any, concerning the privacy and security of end user and consumer data and information, such as authentication, authorization and other methodologies or technologies. Periodic in-person updates are also encouraged. (It is recommended that this report be sent to each of the Country Code 1 countries.)

8. The ENUM LLC will provide a report within sixty days following the conclusion of the trial summarizing its findings and conclusions.

9. The ENUM LLC will promptly provide, upon request, information regarding all numbers contained in the Tier 1A database.

10. The trial delegation for Country Code 1 shall terminate no later than 365 days after the delegation has occurred at RIPE NCC.

11. The ENUM LLC will provide all U.S. trial participants with a copy of these terms and conditions and require that each agree to abide by these terms and conditions during the trial period.

12. The U. S. Government may terminate its support of the trial delegation at any time for failure on the part of any trial participant to comply fully with any of these terms and conditions.

UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

The Honorable David A. Gross
U.S. Coordinator for International Communications
and Information Policy
Department of State
2201 C Street, N.W.
Washington, DC 20520

Dear Ambassador Gross:

The convergence of telecommunications and computing technologies is once again presenting the Unit
States with an important decision that will impact how our nation will maintain its world leadership in
technology policy. We currently have the opportunity to participate or "opt in" to the new global domai
set aside for electronic numbering (ENUM), e164.arpa. Because of the potential benefits of ENUM, the
Department of Commerce through the National Telecommunications and Information Administration
(NTIA) believes that the United States should seize this opportunity and take steps to participate in
e164.arpa, consistent with the highest standards of security, competition, and privacy.

As a mapping protocol that links the Internet and telephony platforms through a single identifier, ENUI
has the potential to facilitate convergence of communications networks by linking e-mail addresses,
telephone numbers, fax numbers, and cell phone numbers for individuals or businesses. To date, thirtee
International Telecommunication Union (ITU) member nations, including the United Kingdom, have
opted into e164.arpa and are beginning to establish trials to provide ENUM services. The United States
has been supportive of ITU work in this area, recognizing that using ENUM through a globally
coordinated domain may provide efficiencies and opportunities for global interconnectivity that could
benefit both industry and users. As you recall, during the September 2001 Study Group 2 meeting, the
United States expressed our support for the ITU's work regarding RFC 2916, the proposed standard for
ENUM, which designates e164.arpa as the top-level domain of the ENUM tree.

While NTIA recommends that the State Department continue to support work at the ITU to reach
conclusion on the ENUM Recommendations and Supplement, the time has come for the United States
be more active on this issue. Specifically, the United States should move quickly to address certain key
preliminary issues regarding U.S. implementation of ENUM and, if resolved satisfactorily, then formal
opt in to e164.arpa.

On the domestic side, we must ensure that ENUM can be implemented in a pro-consumer, secure, and
competitive manner. In August 2002, NTIA held a forum on ENUM at which industry and non-profit
entities discussed the various benefits and challenges of this new technology. There was strong
consensus among the forum participants in favor of the United States opting in to e164.arpa, but only if
ENUM can be implemented in a way that ensures competition, interoperability, security, and privacy.

Keeping this view in mind, we have developed principles to guide domestic implementation of ENUM. The following principles have strong roots in proven telecommunications and technology policies and are intended to maximize opportunities for industry, while protecting the security and privacy of consumers in the United States:

- **Preserve national sovereignty:** Any participation by the United States in a coordinated, global approach must preserve the United States' national sovereignty. That is, the United States and every other participating nation should have the right to determine whether and in what manner ENUM or any alternative is implemented domestically.

- **Support competition:** Domestic implementation of ENUM must also allow for competition among providers and operators on as many levels as feasible.

- **Promote innovation:** Adoption of ENUM or ENUM alternatives must encourage innovation and promote advanced voice and data services through new products, services, and vendors.

- **Protect users' security and privacy:** Domestic implementation of ENUM must be done in a manner that maximizes the privacy and security of user data entered in the ENUM DNS domain. For example, ENUM providers should develop systems to ensure the authentication and authorization of users who enter and update their personal information.

- **Minimize regulation:** Governance of ENUM on the international and national level must be accomplished through the least regulatory means possible. For example, a coordinated, global approach to ENUM should not give rise to a new regulatory apparatus to govern international and domestic implementation.

- **Preserve opportunity for alternative deployments:** The implementation of ENUM within the United States must not preclude alternative deployments of ENUM or other solutions that may provide competitive alternatives to ENUM.

- **Allow for interoperability:** In order to support competition and the emergence of alternative technologies and networks, the implementation of ENUM within the United States should accommodate alternative deployments' interconnection with the ENUM tree.

- **Preserve stability and security:** Any implementation of ENUM must not diminish the stability and security of the Internet or telecommunications systems.

Before opting in to e164.arpa, we must ensure that ENUM can be implemented domestically in a mann consistent with the above principles. These factors also should play a role in the selection of Tier 1 operator(s). NTIA is committed to working with the Department of State and the relevant agencies, suc as the Federal Communications Commission (FCC), to ensure that ENUM can be implemented in this manner.

Internationally, the ITU procedures to opt in require that each Member State enter its specific country code (or portion of a country code) into the ENUM tree. The United States will need to determine how best to coordinate this process with the nineteen nations in Country Code 1. Once these implementation issues are resolved, the Department of State would make any necessary notifications regarding the United States' decision to opt in. Industry can then establish trials and begin to provide ENUM services to U.S. businesses and consumers.

NTIA is committed to working diligently to resolve these implementation issues with the FCC and the Department of State. These three agencies are beginning a series of meetings to establish processes to determine how to resolve both the domestic and international questions. I look forward to working with you and Chairman Powell to ensure a successful multilateral and domestic review of ENUM so that we can soon begin to reap the benefits of ENUM within the United States.

                    Sincerely,

                    Nancy J. Victory

cc: Chairman Michael K. Powell

NTIA Home   Domestic   International   Spectrum   Grants   Research

EXHIBIT 2

CC1 ENUM LLC

Country Code 1 ENUM Limited Liability Company

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September 30, 2005

Ambassador David A. Gross
U.S. Coordinator, International Communications and Information Policy
Department of State
2201 C Street NW
Washington, D.C. 20520

Subject: Country Code 1 Delegation Request by the CC1 ENUM LLC

Ambassador Gross,

The telecommunications and Internet industries established the Country Code 1 ENUM Limited
Liability Company (LLC) to create the public infrastructure that will promote the development
of ENUM technology in the countries of the North American Numbering Plan (NANP). The
LLC is not intended to profit from this activity but rather to enable the entire industry and its
customers to reap the benefits of ENUM.   ENUM is a technology that allows users to combine
the resources of the Internet with traditional telephony, uniting these two diverse worlds of
communications and enabling a whole new range of communication applications. The ENUM
system effectively enables individuals, businesses and other organizations to maximize the use of
both the public Internet and the Public Switched Telephone Network (PSTN) by associating
telephone numbers with Internet domain names.

The LLC is asking the United States, and each of the other countries that comprise Country Code
1 (CC1) to request the temporary delegation of the ENUM domain corresponding to Country
Code 1 (1.e164.arpa) from the International Telecommunications Union (ITU) to support an
ENUM trial. The CC1 ENUM trial will allow those NANP member countries who have an
interest in furthering their knowledge of ENUM to pursue that opportunity. The CC1 ENUM
LLC agrees to the United States 1.e164.arpa ENUM trial delegation "Terms and Conditions for a
U.S. Trial of ENUM", dated September 2, 2005 (attached). Attached is also the ENUM Forum's
ENUM Trial Framework document. The LLC recognizes that some of the trial proposals
contained in the framework conflict with the US Terms and Conditions, and therefore they will
be excluded from this trial until appropriate approval has been obtained for such activity.

The trial and the temporary delegation will run no longer than twelve (12) months from the confirmation date of the delegation. The ITU requires that the Administration from at least two countries in a shared country code, such as CC1, request the ENUM delegation for that country code (See ITU ENUM administration ad interim at http://www.itu.int/ITU-T/inr/enum/procedures.html). The ITU will then notify all countries of the delegation request. If there are no objections to the delegation within a 60-day period, the ITU will authorize the delegation and the CC1 ENUM trial can commence.

The LLC, in preparation for the delegation request, has signed a Memorandum of Understanding (MOU) with the Canadian Internet Registry Authority (CIRA) (see attachment) to host the trial Tier 1A registry. CIRA is a not-for-profit private Canadian corporation established in 1998 to be responsible for operating the .ca Internet country code Top Level Domain (ccTLD) as a public resource. The LLC concluded that this expertise as the .ca registry will be advantageous to the CC1 ENUM trial.
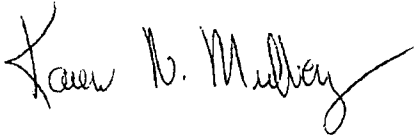
The Country Code 1 delegation will contain both technical and administrative components, each to be held by different entities. CIRA will serve as the technical contact for the length of the trial. The LLC would act as the administrative contact for the trial. The LLC will also be responsible for addressing any management issues that may arise during the trial or with the CIRA MOU. The LLC determined that a trial will allow each country to determine its participation, allowing each participating country's providers to become familiar with ENUM and its various components. The lessons learned will be used in crafting the commercial CC1 ENUM architecture and operational requirements. In addition, a trial will provide participating NANP countries with a better understanding of ENUM, its commercial value and technical capabilities. The LLC intends for the trial to be consistent with the relevant open standards of the Internet Engineering Task Force (IETF) and the ITU upon which ENUM is based. It also intends that both the trial and commercial platforms for the NANP implementation of ENUM will adhere to each country's privacy regulations as well as accommodate national and industry requirements.

The LLC is making this temporary trial delegation request for the express purpose of seeking a practical understanding of how to create a commercial platform on which ENUM may be implemented within those participating NANP countries. Additionally, the trial will allow those interested NANP countries, as well as providers within those countries, the opportunity to experiment with ENUM before making a determination on how to proceed to a permanent commercial platform. With the information gleaned from trial participants and CIRA, the LLC intends to issue a Request for Proposal to select a commercial vendor to implement a Tier 1A, or skinny Tier 1, as the foundation of the single, public ENUM system for Country Code 1 by hosting the NPAs of those countries that have authorized their inclusion. This ENUM architecture model enables the shared Country Code 1 to be delegated into ENUM and also protects each NANP member country's sovereign rights to determine whether they want to participate. Those NANP countries that choose to participate in ENUM will need to authorize the inclusion of their numbering resources in the trial Tier 1A and/or the permanent Tier 1A commercial platform when it becomes available.

The CC1 ENUM LLC would like to request that the United States support the Country Code 1 ENUM trial delegation. To that end, the LLC asks your Administration to submit a formal request for the CC1 delegation to H. Zhao, Director of the Telecommunication Standardization Bureau at the ITU within the next 30 days.

If you have any questions or concerns, please contact me as the Chairman of the CC1 ENUM LLC at 972-896-8686 or the Vice-Chairman, James Baskin at 973-783-5873.

Sincerely,

Karen N. Mulberry
Chairman, CC1 ENUM LLC

Attachments:
1. Terms and Conditions for a U.S. Trial of ENUM
2. CIRA MOU
3. ENUM Forum ENUM Trial Framework
4. International Telecommunications Union (ITU) Country Code Delegation Contact

CC:
Michael Gallagher   Assistant Secretary of Commerce for Communications
and Information and NTIA Administrator
Kevin Martin   Chairman, Federal Communications Commission
Deborah Platt Majoras Chairman, Federal Trade Commission

EXHIBIT 3

CC1 ENUM LLC

Country Code 1 ENUM Limited Liability Company

C/o McKenna Long and Aldridge LLP
1875 Lawrence St, Suite 200
Denver CO 80202

Karen N. Mulberry
Chairman, CC1 ENUM LLC
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September 30, 2005

Mr. Michael M. Binder
Assistant Deputy Minister
Industry Canada
Spectrum, Information Technologies and Telecommunications
Jean Edmonds Tower North - Floor: 20 - Room 2035
300 Slater Street
Ottawa, Ontario
Canada
K1A 0C8

Subject: Country Code 1 Delegation Request by the CC1 ENUM LLC

Assistant Deputy Minister Binder,

The telecommunications and Internet industries established the Country Code 1 ENUM Limited
Liability Company (LLC) to create the public infrastructure that will promote the development
of ENUM technology in the countries of the North American Numbering Plan (NANP). The
LLC is not intended to profit from this activity but rather to enable the entire industry and its
customers to reap the benefits of ENUM.   ENUM is a technology that allows users to combine
the resources of the Internet with traditional telephony, uniting these two diverse worlds of
communications and enabling a whole new range of communication applications. The ENUM
system effectively enables individuals, businesses and other organizations to maximize the use of
both the public Internet and the Public Switched Telephone Network (PSTN) by associating
telephone numbers with Internet domain names.

The LLC is asking Canada, and each of the other countries that comprise Country Code 1 (CC1)
to request the temporary delegation of the ENUM domain corresponding to Country Code 1
(1.e164.arpa) from the International Telecommunications Union (ITU) to support an ENUM
trial. The CC1 ENUM trial will allow those NANP member countries who have an interest in
furthering their knowledge of ENUM to pursue that opportunity. The CC1 ENUM LLC agrees
to the United States 1.e164.arpa ENUM trial delegation "Terms and Conditions for a U.S. Trial
of ENUM", dated September 2, 2005 (attached). Attached is also the ENUM Forum's ENUM
Trial Framework document. The LLC recognizes that some of the trial proposals contained in the
framework conflict with the US Terms and Conditions, and therefore they will be excluded from
this trial until appropriate approval has been obtained for such activity.

The trial and the temporary delegation will run no longer than twelve (12) months from the confirmation date of the delegation. The ITU requires that the Administration from at least two countries in a shared country code, such as CC1, request the ENUM delegation for that country code (See ITU ENUM administration ad interim at http://www.itu.int/ITU-T/inr/enum/procedures.html). The ITU will then notify all countries of the delegation request. If there are no objections to the delegation within a 60-day period, the ITU will authorize the delegation and the CC1 ENUM trial can commence.

The LLC, in preparation for the delegation request, has signed a Memorandum of Understanding (MOU) with the Canadian Internet Registry Authority (CIRA) (see attachment) to host the trial Tier 1A registry. CIRA is a not-for-profit private Canadian corporation established in 1998 to be responsible for operating the .ca Internet country code Top Level Domain (ccTLD) as a public resource. The LLC concluded that this expertise as the .ca registry will be advantageous to the CC1 ENUM trial.
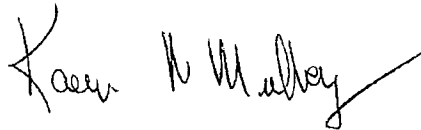
The Country Code 1 delegation will contain both technical and administrative components, each to be held by different entities. CIRA will serve as the technical contact for the length of the trial. The LLC would act as the administrative contact for the trial. The LLC will also be responsible for addressing any management issues that may arise during the trial or with the CIRA MOU. The LLC determined that a trial will allow each country to determine its participation, allowing each participating country's providers to become familiar with ENUM and its various components. The lessons learned will be used in crafting the commercial CC1 ENUM architecture and operational requirements. In addition, a trial will provide participating NANP countries with a better understanding of ENUM, its commercial value and technical capabilities. The LLC intends for the trial to be consistent with the relevant open standards of the Internet Engineering Task Force (IETF) and the ITU upon which ENUM is based. It also intends that both the trial and commercial platforms for the NANP implementation of ENUM will adhere to each country's privacy regulations as well as accommodate national and industry requirements.

The LLC is making this temporary trial delegation request for the express purpose of seeking a practical understanding of how to create a commercial platform on which ENUM may be implemented within those participating NANP countries. Additionally, the trial will allow those interested NANP countries, as well as providers within those countries, the opportunity to experiment with ENUM before making a determination on how to proceed to a permanent commercial platform. With the information gleaned from trial participants and CIRA, the LLC intends to issue a Request for Proposal to select a commercial vendor to implement a Tier 1A, or skinny Tier 1, as the foundation of the single, public ENUM system for Country Code 1 by hosting the NPAs of those countries that have authorized their inclusion. This ENUM architecture model enables the shared Country Code 1 to be delegated into ENUM and also protects each NANP member country's sovereign rights to determine whether they want to participate. Those NANP countries that choose to participate in ENUM will need to authorize the inclusion of their numbering resources in the trial Tier 1A and/or the permanent Tier 1A commercial platform when it becomes available.

The CC1 ENUM LLC would like to request that Canada support the Country Code 1 ENUM trial delegation. To that end, the LLC asks your Administration to submit a formal request for the CC1 delegation to H. Zhao, Director of the Telecommunication Standardization Bureau at the ITU within the next 30 days.

If you have any questions or concerns, please contact me as the Chairman of the CC1 ENUM LLC at 972-896-8686 or the Vice-Chairman, James Baskin at 973-783-5873.

Sincerely,

Karen N. Mulberry
Chairman, CC1 ENUM LLC

Attachments:
1. Terms and Conditions for a U.S. Trial of ENUM
2. CIRA MOU
3. ENUM Forum ENUM Trial Framework
4. International Telecommunications Union (ITU) Country Code Delegation Contact

CC:
Mr. Larry Shaw
Director General
Industry Canada
Telecommunications Policy Branch

EXHIBIT 4

Framework Document for a US/CC1 ENUM Trials Program

ENUM Forum Document #6003_1_0

Source: ENUM Forum
http://www.enumf.org or http://www.enum-forum.org

Editor: Steven D. Lind
sdlind@att.com
973-236-6787

Date: May 3, 2005

Abstract: This document describes a framework for an ENUM trials program within the US/CC1. It gives a picture of how such trials might be conducted using a trial CC1 infrastructure, which is one of some of the possible architectures for implementing US/CC1 trials.

The document also identifies some issues that would need resolution before trials could begin. This document is not intended to proscribe anything about trials that might be conducted by other CC1 countries.

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Framework Document for a US/CC1 ENUM Trials Program

CONTEXT

1 Introduction - Rationale for Conducting Trials

There is a desire within the industry to get ENUM working for numbers within Country Code 1 (CC1). The industry created a formal Limited Liability Company (LLC) to procure and oversee the official Tier 1A function for numbers within Country Code 1 and Tier 1B functions for numbers within the United States; the CC1 ENUM LLC was established on September 29, 2004. The LLC's procurement process is expected to take some time. Accordingly, in order to enable CC1 nations to be ready to provide ENUM service as soon as the LLC Tier 1 is complete, the potential for conducting ENUM-related trials via a test bed implementation, one of several possible architectures, is proposed here[1].

This document describes a concept to provide early Tier 1 service for trials. It is designed to help industry test ENUM services, to trial the registration process, and to get hands-on experience for the LLC working on the RFP for the official Tier 1 vehicle. In particular, trials involving limited call/service setup and completion, e.g., an ENUM-enabled application service could be performed.

A test bed platform, one of several possible architectures, could also support a variety of scenarios in response to suggestions from industry and government. This could include experiments with Tier 1 architectures, non-geographic numbering, and registry-registrar interactions.

2 Scope

This document is intended for any party who has an interest in ENUM trials within Country Code 1, and specially within the United States. It may include parties who wish to actively participate in deploying trial facilities and platforms, those who may wish to utilize those facilities and platforms, and those interested in the direction and results of any trials that take place. It would be expected that the principal participants would be those directly involved in the telecommunication and Internet industries.

The scope of these trials must include definitive start and sunset dates. These trials are intended to take place during the gap between current time and the point at which the formal Tier 1 functions of the US/CC1 ENUM LLC's procurement begin operations.

The domain for these trials shall be the Country Code 1 delegation from e164.arpa. The trials may be country code 1 specific or even further limited to only US NPAs from within country code 1.

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[1] See GEN0095R0, GEN0097R0 and ad hoc Contribution from AG Design, LLC and Seiri, Inc. dated 23 March 2004

3 Terms and Definitions

Terms of 6000_1_0 are incorporated by reference. Beyond that, the following terms and definitions are used within this document:

Testbed   A collection of hardware and software systems that have been assembled for the purpose of satisfying the requirements and objectives of an ENUM trial.

Trial   The activities that, when performed in some logical order, satisfy the requirements and objectives described in this document.

4 Objectives and Principles

The overall object of this document is to describe a framework for a US/CC1 ENUM trials program. The trials program has the following objectives:

- To decouple policy and technological goals to allow for concurrent progress of both, and in particular, to allow for a faster timeline for ENUM trials;

- To conduct tests of zone architectures using designated US/CC1 telephone numbers mapped into the e164.arpa domain;

- To test the Query/Response mechanism of the ENUM DNS protocol using NANP numbers in e164.arpa and test resource records in various domains;

- To perform tests of call setup and completion for test user agents/service providers of ENUM-enabled services;

- To test registration and operational procedures and interfaces that could apply between the roles involved in ENUM implementation: US/CC1 Tier 1, US Tier 2, Registrar, Application Service Provider, etc.; and

- To evaluate potential DNS security mechanisms

The key principles of the trial are:

- The trials should have a specific sunset, which could be up until the time when the official contracted Tier 1 function is ready for service

- The trials should preserve national sovereignty, which is the continued right of each country sharing Country Code 1 to determine if and how it chooses to participate in ENUM

- The trials should be operated in an open, neutral and transparent fashion. A report of the trial results will be made publicly available except for those portions of individual participant's results that involve proprietary information

- There should be no competitive advantage conferred to potential bidders in the Tier 1 procurement process It is envisaged that all volunteer(s) for the role of a Tier 1B Registry would be accommodated in the trial

- The costs of participating in the trial should be borne by the individual participants, with the possibility of support from other interested parties

- The trial is limited to non-commercial activities. Commercial and retail end-users will not be a part of the trial. Any registrations in the Tier 1B Registry(ies) will not survive the trial

- The trials should not automatically preclude any particular technical activities that participants wish to conduct. The administrator of the trial must approve activities that affect the principal architecture or the primary interfaces between the identified roles. Technical activities that only affect the ENUM-enabled applications that a participant or group of participants wish(es) to run may be conducted without any prior permission

FRAMEWORK

5   Architecture to be Implemented for the Trials

5.1   Functional Architecture

The functional architecture for ENUM in the US has several layers. In the first figure in this section, the functional entities are shown in three layers:

- International, which consists of the DNS root and the Tier 0 for ENUM. Tier 0 has the domain name "e164.arpa" and contains the delegations for country codes

- Country Code 1, which holds the Tier 1A (skinny Tier 1) for Country Code 1. Its domain name is "1.e164.arpa" and it will contain delegations for NPAs from countries that choose to participate in the trial

- Individual E.164 Zones for NPAs, which is comprised of the Tier 1B Registry(ies), Registrars, and Registrants. It also includes the Authentication and Verification Entities. Below these are the Tier 2 Providers and the Application Service Providers

In the second figure in this section, the functional components for a Trials Platform (one of several possible architectures) are shown. The component groups are:

- Trial Tier 1A for Country Code 1,

- Trial Tier 1B for the US, and

- Test and Development Systems

The elements of those components are described later in this section.

The third figure is in the next subsection. It is a conceptual diagram of a Tier 1 Platform and includes a schematic illustration of Internet connectivity.

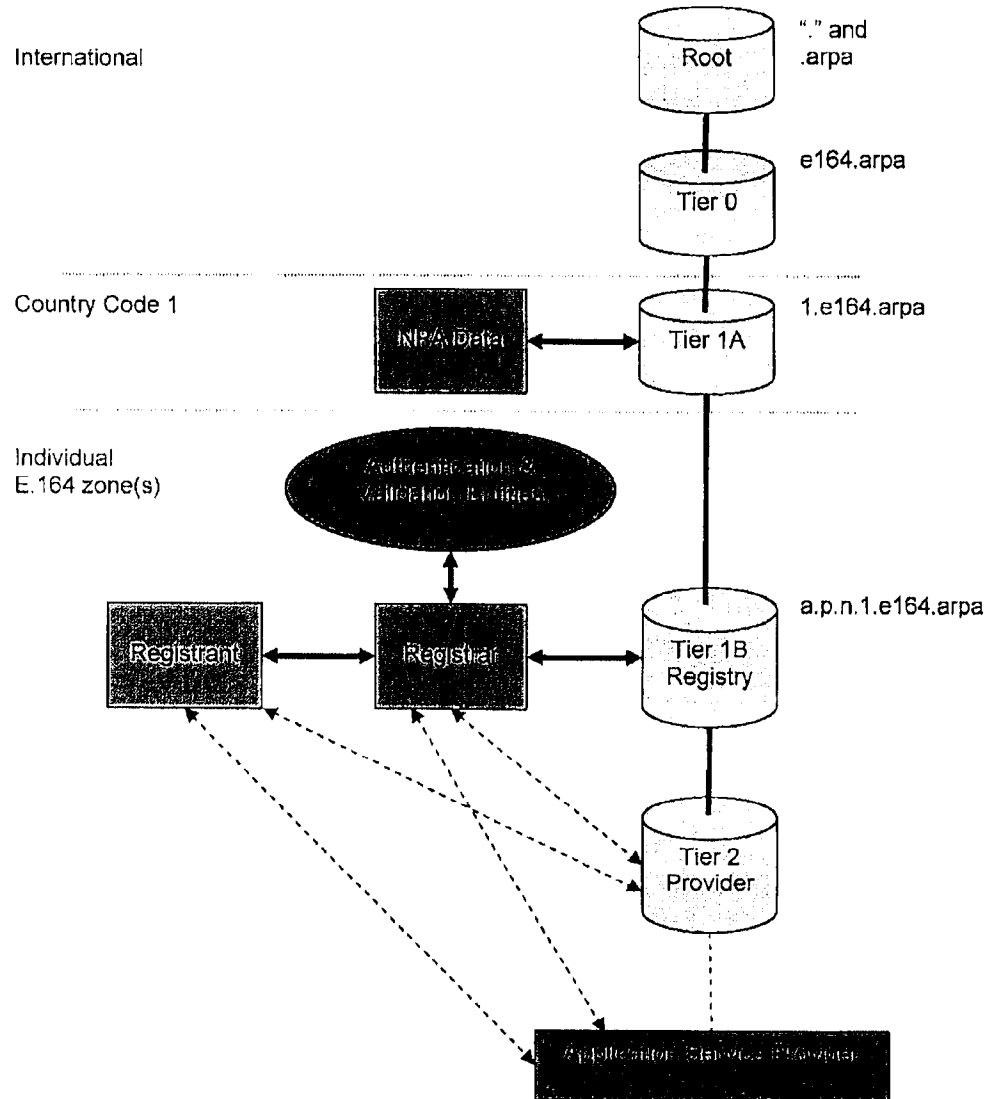The diagram for the overall functional architecture is as follows:

Figure 1 - ENUM Functional Architecture

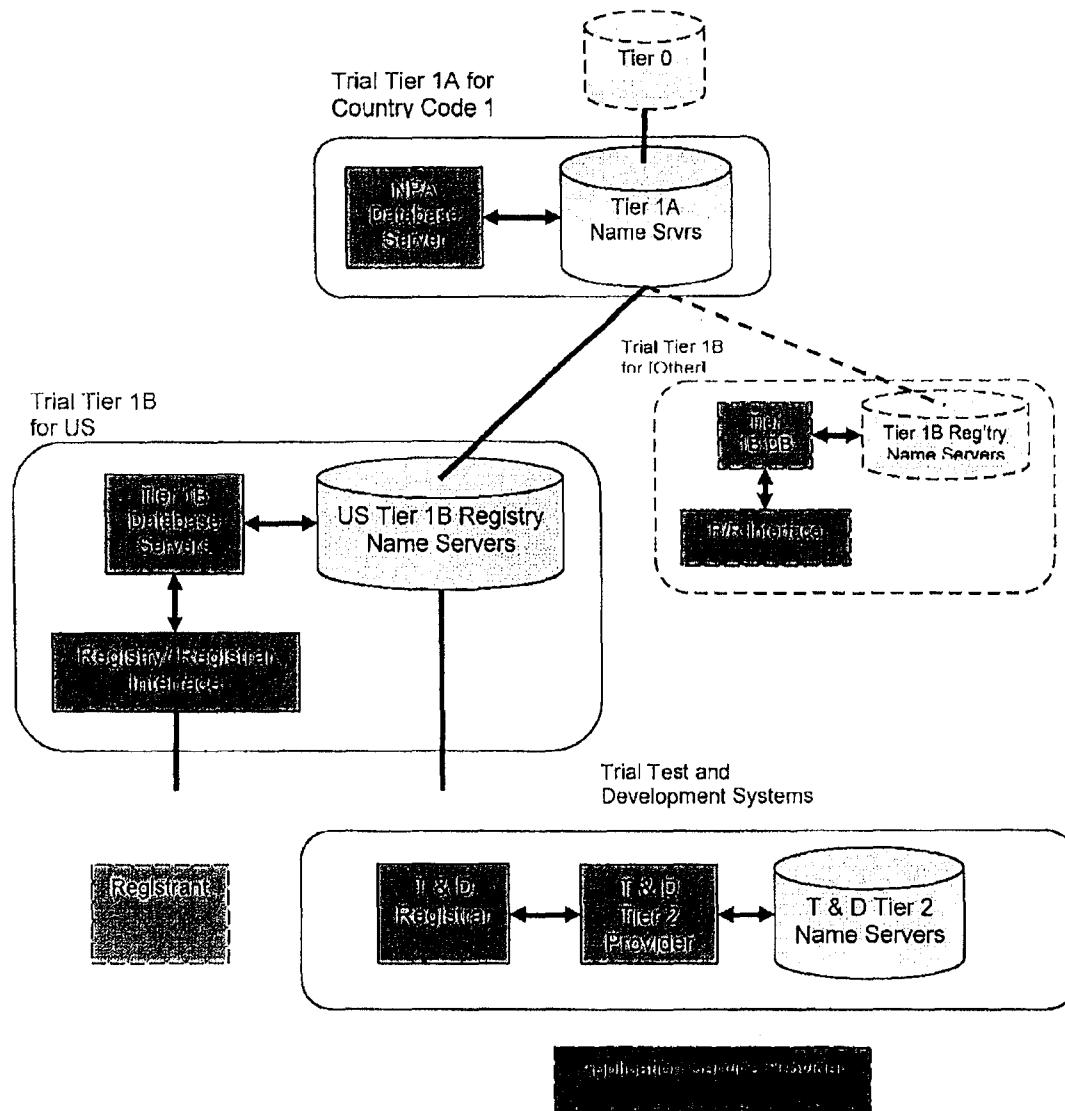The diagram showing three sets of components for a Trial Platform is as follows:

Figure 2 - Components of a Platform for ENUM Trials

More information on these components is contained in the next subsection.

5.2 Physical Architecture

There are several different physical architectures that could be used to implement a test bed for ENUM trials. This subsection describes a modest approach for implementing a Tier 1 platform.

There are three sets of components proposed for the trial Platform.

- Trial Tier 1A (Skinny Tier 1) for Country Code 1

    The trial Tier 1A consists of Name Servers for the zone 1.e164.arpa and the database server for generating the zone files for 1.e164.arpa. This zone contains the delegations for the NPAs delegated to the trial Tier 1B Registries.

- Trial Tier 1B(s) for the US

    The US Tier 1B(s) consist of Name Servers for the ENUM zones of each NPA used in the trials program, the database server used for generating the zone files for each such zone, and a test Registry/Registrar Interface (RRI) plus the Registry side of the RRI. In this document the domain name for an NPA's zone is written as a.p.n.1.e164.arpa.

    Note that this setup can also handle trial Tier 1B functions for the NPAs used by other NANP countries that might choose to participate in the trials program.

- Trial Test and Development Systems

    Additional systems are needed for a variety of things. There is a need to implement test Trial Tier 2 Providers to respond to test ENUM queries.

    Also test systems need to be able to generate ENUM queries, to host ENUM-enabled client applications, to host test server-based applications, and to test the Registrar side of the test Registry/Registrar Interface.

These components will need Internet connectivity, and should be able to support functions for systems operations, administration, and management, including security, backups, and reporting.

The trial platform would be delegated the zone for Country Code 1. In turn it would create a (skinny) Tier 1A, in which zones for each NPA would only be populated or delegated at the request of the relevant country. Individual NANP countries could have their own ENUM Tier 1B name servers to acknowledge national sovereignty for those countries. Any trial activity should be coordinated directly or through the US Department of State. The US Department of State needs to be involved due to the fact that they are the authorized entity that, with the other NANP countries, would request the ITU-T to delegate Country Code 1. For the purposes of this trial, limited non-geographic numbers could be registered based on subsequent specifications and agreements.

For certain NPAs, DNS zones would be populated with numbers. For example, for NPA = 203, there could be DNS resource records for domain names like [0.9.8.7.6.5.4.3.0.2.1.]e164.arpa (for the phone number [1-203-456-7890]). Those resource records would point to the nameservers of Tier 2 providers, which contain records for applications associated with that number.

5.3 Policy Architecture

Participation in the ENUM trials is voluntary, open and should minimally consist of ENUM Registry(ies), ENUM Tier 2 Providers, and Registrars. Application Service Providers are also encouraged to participate. A list of proposed NPAs for each CC1 nation's trial will be generated by their trial participants. Each CC1 nation will then designate and authorize the NPAs that will be officially used in the trial. These NPAs will then be entered into the ENUM Tier 1A registry(ies) in preparation for the commencement of the trial.

Prior to the start of the trial each of the participating entities will sign a MoU agreeing to the criteria and terms and conditions of the trial. Additional agreements between trial partners and or sub-contractors shall be the responsibility of the partners themselves.

The ENUM Tier 1B registry(ies) will work together with the Tier 2 providers and Registrars on the basis of a trust agreement, which indicates that applications submitted by registrars for the delegation of an ENUM domain will be regarded as valid. The Registrars will incur costs for each trial participant and therefore Registrars are not expected to accommodate an unlimited number of participants in the trial, but are encouraged to accommodate as many participants as possible. Residential unlisted numbers shall not be part of the ENUM trials.

The ENUM Tier 1B Registry(ies) will make its services available to interested ENUM Tier 2 Providers and Registrars on the same terms and conditions during the duration of the trial. However, the Tier 1B Registry(ies) will be obligated to make its services available only to those ENUM Tier 2 Service Providers and Registrars participating in the trial.

The participation of multiple Tier 2 Providers is encouraged.

The trial participants accept all liability relative to their national trials. All participants must realize that the trial is conducted on a best-effort basis using non-production services.

There will be no external funding available for the trial. Therefore, each participant must assume all costs associated with the trial. In addition, participation in the trial does not imply or guarantee similar roles when commercial introduction of ENUM is implemented.

The results of the trial will be made public, however proprietary activities of individual participants need not be included.

5.4 Schedule

The following schedule is based on the date on which the members of the ENUM Forum approve this document, and is expressed in incremental weeks from that date. It also assumes that the delegation of CC1 has already taken place.

The trial schedule is as follows:

	Date
Participants identified	+2 weeks
MoU Signed	+4 weeks
Trial Begins	+6 weeks
Trial Ends	+32 weeks
Report generation	+36 weeks

After this date all of the functions (mailing list, web site, ENUM Tier 1B Registry, TSP validation) will cease to exist.

6 Roles

Some of these entities will directly interface with the Tier 1A/Tier 1B; others will interface with intermediaries rather than directly with the Tier 1A/1B. One of the main trial objectives is to test the architectural, technical, and operational aspects for 1.e164.arpa related to the provision of ENUM capabilities as defined in IETF RFC 3761.

6.1 Tier 1A Registry

The Tier 1A Registry must establish an interface that is available for all Tier 1B Registries to use. The common protocol may be used between the Tier 1A and the Tier 1B, should separate roles be adopted by trial participants.
The Tier 1A Registry should ensure that they meet the following requirements:

- "The Tier 1A Registry must demonstrate relevant registry experience
- "The Tier 1A Registry must commit suitably experienced staff resources for the trial
- "The Tier 1A registry must commit to providing sufficient trial technical resources

6.2 Tier 1B Registry

The Tier 1B Registry is the entity responsible for providing ENUM Registry services for US telephone numbers in full E.164 format, including management of pointers to Tier 2 Provider nameservers. The Tier 1B Registry does not handle NAPTR records but points at Tier 2 Providers where NAPTR records associated with E.164 numbers are stored.

According to ENUM Forum Document 6000, Tier 1 Registry has interactions with DNS Providers and Registrars. This is the role that the Tier 1B will play for the US, however for the purposes of this trial the Tier 1A may also play the role of a Tier 1B. The Tier 1B Registry must establish an interface which is available for all Registrars to use. The common protocol may be EPP, but this should not preclude other protocols being used between the Registry and Registrars subject to the prior agreement of those trial participants. The protocols to be used on the interface between Tier 1B Registry and Registrars must be agreed between those parties.

The Tier 1B Registry should ensure that they meet the following requirements:

- The Tier 1B Registry must demonstrate relevant registry (e.g. nameserver operations) experience
- The Tier 1B Registry must commit suitably experienced staff resources for the trial
- The Tier 1B registry must commit to providing sufficient trial technical resources
- The Tier 1B Registry must maintain a listing of all registered testing numbers

6.3   Registrar

The Registrar is an entity that provides registration services to Registrants. Registrars also are the operational contact with Registrants and they interface between the Registrant, the Tier 1B Registry and Tier 2 Providers. A Registrar may also be a Tier 2 Provider or may interface with other independent Tier 2 Providers.

Registrars should ensure that they meet the following requirements:

- Registrars must commit to the provision of sufficient staff and technical resources for the trial
- Registrars must commit to strictly complying with all Data Protection statutes and relevant guidelines
- Any nameservers operated by the Registrar must comply with DNS requirements
- Registrars must be capable of carrying out their role in accordance with ENUM Forum 6000_1_0, Section 11, Registrar Requirements
- Registrars must be prepared to disclose relevant information gathered during the trial and participate in trial reporting
- Registrars must commit to providing resources appropriate to satisfactory completion of the trial
- Registrars must establish an interface with a Tier 1B Registry and Tier 2 Providers. The common protocol should be EPP, but this does not preclude other protocols being used between the Registry and Registrars subject to the prior agreement of those trial participants. The protocols to be used at the interface between Tier 1B Registry and Registrars are executed bilaterally
- For the purpose of this trial, Registrars will not charge for services

- Registrars may provide an interface to allow end users to manipulate their NAPTR records. The Registrar may provide guidance to the end user on the recommended structure or content of NAPTR records
- Registrars should provide a means by which the end user can be validated to enable record manipulation. This may require the Registrar to establish an 'on-line' relationship with an Authentication Agency so that validation (e.g., via a digital certificate, username & password) can be validated in real time

6.4   Authentication Agency

Authentication Agencies are responsible for providing information that may be used by the Registrar in validating the assignment of ENUM end user E.164 numbers. An Authentication Agency can be a Telephony Service Provider or National Number Plan Administrator or any entity capable of providing the registrar with the data needed for authentication, such as a national hub provider or data clearinghouse. National hub providers and data clearinghouses have access to multiple data sources from telephony service providers and various other sources. The role of an Authentication Agency will be to provide information that may confirm to the Registrar that the Registrant is the rightful assignee of the E.164 telephone number that they wish to enter into the DNS.

The Authentication Agency should ensure that they meet the following requirements:

- An Authentication Agency must be prepared to discuss any relevant findings gathered during the course of the trial

- An Authentication Agency must commit to providing resources appropriate to satisfactory completion of the trial and may only charge for such services where tariffs have been established

6.5   Tier 2 Provider

The Tier 2 Provider manages the ENUM fully qualified domain name associated with an E.164 number and acts as the Registrant's NAPTR records hosting company. The Tier 2 Provider maintains the actual NAPTR records that contain information for specific communication services.

The Tier 2 Provider should ensure that they meet the relevant requirements specified in the ENUM Forum 6000_1_0 Document in the context of the trial. For the purpose of this trial the Tier 2 Provider will not charge for services.

6.6   Application Service Provider

The Application Service Provider (ASP) will provide the applications directly to the ENUM end users in the context of the trial. The role of the ASP is to provide applications to the end user. The ASP is an entity which runs application servers that facilitate

operation of the various data uploading and maintenance aspects of ENUM and/or the query/response/usage side of ENUM NAPTR records. For example, fully automated querying of a telephone number could be triggered by clicking the "Send" button of an end user device client in which the telephone number is entered as the address.

ASPs should ensure that they meet the following requirements:

- Application Service Providers must commit to providing sufficient staff and technical resources for the trial. Application Service Providers will commit to providing resources appropriate to satisfactory completion of the trial
- The end user will determine and control the content of the NAPTR records. However, since the application will be using this data in order to provide the service, ASPs may provide end user guidance on recommended content or structure of the NAPTR records
- Application Service Providers must be prepared to disclose the relevant information gathered during the course of the trial
- For the purpose of this trial, ASPs should not generally charge for services

TRIALS

7 Activities

Start of the trial is dependent on the approval of CC1 delegation by the Governmental Agencies of countries within the NANP area. This delegation is also dependent on the parameters specified by the ITU-T Study Group 2 Interim Procedures.

It is assumed that the trial would be of a specific duration, in this case 6 months. This timeframe is expected to allow the trial to complete prior to any commercial implementation as defined by the CC1 ENUM LLC. If necessary, the trial could be extended with the consensus of the trial participants and the trial sponsor as well as the approval of the appropriate Governmental Agencies.

Each Phase should generate a report of the results with suggestions for the CC1 ENUM LLC. The phases may overlap.

7.1 Phase 1 - Registry Infrastructure

Roles
Involved: Skinny Tier 1A, Tier 1Bs, Tier 2 Providers, Application Service Providers

Duration: 1 month

Activities: The first activity is to implement the delegation of Country Code 1 from the Tier 0 Registry (RIPE-NCC) to the designated Skinny Tier 1A. Once the primary name server is established, any secondary name servers should also be identified within the Tier 0 Registry. The secondary Tier 1A name servers may be operated by a different organization than the Primary and from a different country within the NANP area.

The Tier 1A should ensure that:

- all records in the Tier 0 are correct and are transferred to the secondary name servers in a reasonable timeframe;
- queries for a domain name of "1.e164.arpa" are resolvable to all of the Tier 1A name servers

The second activity is to delegate one or more NPAs to each of the various Tier 1B Registries. The Skinny Tier 1A should implement and test a procedure to ensure the integrity of the national opt-in/opt-out process. If there is to be more than one Tier 1B Registry from any specific country, each may be delegated a different NPA for the trial. NPAs to be used in the trial will be determined by the participants based on the locations of the termination points[2]. The transfer of information between the primary Tier 1A and any secondaries must be tested, as well as between any primary and secondary name servers at the Tier 1B levels.

The Tier 1B(s) should ensure that:

- all records in the Tier 1A are correct and are transferred to the secondary name servers in a reasonable timeframe;
- queries for a domain name of "<NPA>.1.e164.arpa" are resolvable to all of the appropriate Tier 1B primary and secondary name servers

The third activity is to delegate telephone numbers from each Tier 1B Registry to Tier 2 name server providers such that every Tier 2 name server will contain test data. Once the test numbers have been delegated, the Tier 2 will load 1 or more NAPTR records for each test number based on the needs of the various Application Service Providers that are participating in the trials.

Tier 2 Providers should ensure that:

- all records in the Tier 1B are correct and are transferred to the secondary name servers in a reasonable timeframe;
- queries for the domain name "<tel. No.>.<NPA>.1.e164.arpa" are resolvable to all appropriate Tier 2 primary and secondary name servers;
- the data in the Tier 2 name servers could be retrieved successfully (e.g., via a utility such as DIG)

The fourth activity is to allow ENUM-enabled ASPs to test query/response activities against the NAPTR records in the Tier 2 name servers. This activity can overlap into Phase 2 with an increased number of telephone numbers being registered.

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[2] For example, if a participant in the Morristown, NJ area wanted to use a telephone number of one of its employees from that area, the NPA 973 should be included in the list of NPAs to be used in the trial.

7.2 Phase 2 - Registry/Registrar Interface

Roles
Involved: Tier 1Bs, Tier 2 Providers, Registrars, Application Service Providers

Duration: 3 months

Activities: The principal activity in this phase is to test the Registry/Registrar interfaces. A first part of this activity is to test establish manual interfaces between the two roles for bootstrap purposes. The manual interface may consist of facsimile or e-mail transmission methods. The amount of data processed via these manual methods should be limited to a reasonable amount (TBD) of transactions. The second and main part of the activity is to implement and test an automated interface using EPP[3] or other interfaces as may be standardized in the future, subject to the prior agreement of those trial participants.

The following scenarios should be tested using the EPP interface between the Registrar and the Tier 1B as well as the Tier 2, as appropriate:

1. add new registration

2. transfer existing registration to new Registrar

3. delete existing registration

4. add new NAPTR records to existing registration
   a.   add different ENUMService types
   b.   add same ENUMService types

5. modify existing registration service data

6. delete some NAPTR records from existing registration

During this phase, participating Registrars should be encouraged to study various procedures for validation and authentication during registration. This should continue into phase 3. Registrars should be encouraged to make use of both external and internal sources to determine which work best and in what specific circumstances (e.g., is the Registrar also an Application Service Provider, does the Registrant already have a relationship with the Registrar).

A second activity is to develop the necessary ContactInfo infrastructure at the appropriate Tiers. This information may be important during the trial process to resolve any issues that arise.

A third activity is to conduct extended call/service setup and completion using ENUM-enabled applications. Termination of communications in this phase should be limited to controlled environments such as within labs. A directory of test numbers should be published and available to trial participants only. ASPs should work with Registrars to include realistic test data and to ensure that all ASPs are given non-discriminatory access

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[3] Using http://www.ietf.org/internet-drafts/draft-ietf-enum-epp-e164-08.txt or the current version as appropriate.

to the registration and update processes. This activity can overlap into Phase 3 where increased complexity in the service environment can be tested.

7.3 Phase 3 - Application Testing

Roles
Involved: Tier 1Bs, Tier 2 Providers, Registrars, Application Service Providers

Duration: 2 months

Activities: In this phase, service providers can test against the trial ENUM infrastructure in order to validate their service architectures. These activities should be conducted on a non-commercial basis. Call completion between endpoints of different service providers should be encouraged.

Alternative approaches to distinguish "carrier" information that would coexist with user-originated NAPTR records should be studied. Some approaches that could be studied *might* include, but need not be limited to, the use of txt or Hinfo to specify a Carrier SPID, the use of non-terminal NAPTRs, experimental ENUMService subtypes (e.g., "E2U+SIP:X-CXRAOR"), and the use of different order values. As part of the study, participants should determine the impact of carrier information on U.S. Government ENUM policy directives and regulatory issues.

In addition, interested parties could test other delegation schemes and registry procedures. Registrars could test automated interfaces (such as via web pages) that would allow Registrants to add new ENUMService data, modify certain existing ENUMService data, and delete certain existing ENUMService data.

8 Issues for Immediate Resolution

The Country Code 1 ENUM LLC will be responsible for selecting a Tier 1A Registry operator and managing that relationship for the trial. This is necessary to enable individual national trials to take place by NANP nations. While not within the scope of the ENUM Forum or the US ENUM Trial, it is recommended that the trial Tier 1A not be permitted to bid on the permanent Tier 1A Registry. This is not an issue with the Tier 1B Registries since all volunteers for that role will be accommodated within the trial framework.

Acceptance of the trials' program will be demonstrated by three events:

- the approval of this document by the membership of the ENUM Forum

- the agreement of at least two CC1 countries to request the temporary delegation of CC1

- the fulfillment of all trial roles by volunteer companies

9   Other/For Further Work

9.1   Zone Architecture

The concept of a zone is based on delegation of the domain name for the zone. The "root" zone for ENUM is e164.arpa, and RIPE NCC acts as the current Tier 0 to administer the DNS records for the164.arpa zone. Tier 0 can then delegate zones for country codes. For example, +46 is the E.164 country code for Sweden, and the zone 6.4.e164.arpa is delegated for Sweden to administer.

The case for country code 1 is different. CC1 is an integrated numbering plan shared by "Canada, the US and its territories, and the Caribbean." There have been many discussions about alternatives for delegating ENUM resources under CC1.

Two principles should apply to whatever architecture is used for ENUM for CC1:

- The domain 1.e164.arpa should be managed as a DNS zone, and
- The domain for each NPA should also be managed as a DNS zone

In other words, there should be DNS delegations (zone cuts) at 1.e164.arpa for CC1 (in the Tier 1A) and at each z.y.x.1.e164.arpa for each NPA +1+xyz (in the Tier 1B).

It is important to note that this approach does not preclude any of the alternatives for DNS delegation. A delegated zone could be administered on the same nameservers as the parent zone, or it could be administered on different name servers. Depending on the specific software implementation used for a specific DNS nameserver, there may be a single "zone file" that contains the data for all the zones hosted by that nameserver.

9.2   Sharing Trial CC1 Administration of 1.e164.arpa

The administration of the CC1 Tier 1A is complicated because more than one country is involved. It is a challenge to find arrangements that are both technically and politically satisfactory. However, there may be ways to share the administration of the CC1 Tier 1A zone by separating and distributing some of the functions. The following approach is suggested as a strawman for discussion.

It is possible for separate parties to

- administer zone data and create the master zone files,
- operate the primary name servers that load the master zone files, and
- operate the secondary name servers that have replicas of the master zone files

Note that "primary/master" and "secondary/slave" refer to the source of zone data files.

- "Primary/master" name servers load their zone files from authoritative offline sources, e.g., authoritative database servers

- "Secondary/slave" name servers load their zone files from other authoritative name servers, e.g., other primary (or secondary) name servers

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For example, either the US or Canada could operate a database server that is the authoritative source of zone data, while either Canada or the US could operate the primary nameservers. Such arrangements could help resolve some open issues during the trial period.

In addition, it is possible for there to be different parties that have administrative responsibility for different sets of 1+NPA zones. For example, within CC1, each participating national administration would be responsible for its own ENUM zone(s), irrespective of the physical architecture of Tier 1.

9.3   DNS Security Mechanisms

One of the most important aspects of the ENUM infrastructure and its provisioning process is security. Data needs to be transfered between various parties in a secure manner. ENUM clients also need to know that responses to ENUM queries are authentic. Various security mechanisms are necessary to make this possible. Some of those mechanisms, however, have yet to be fully implemented and tested in commercial applications. While it is important that the trial be used to evaluate the effectiveness of the various security mechanisms, it may be difficult to fully achieve that objective because of the lack of availability of implementations in applications such as DNS resolvers.

EXHIBIT 5

June 30, 2005 version - final

CC1 ENUM LLC Technical Advisory Committee

Technical and Operational Requirements for an ENUM Tier 1A Registry for Country Code 1

CC1 ENUM LLC

Approved June 30, 2005

Abstract

This document contains technical and operational requirements for operating an ENUM Tier 1A for Country Code 1. This includes interfaces to other entities providing services for ENUM as well as the requirements for deploying and operating the ENUM Tier 1 infrastructure.

FOREWORD

At the time it approved this document, the CC1 ENUM LLC TAC had the following members:

Jim Baskin	TAC Chairman, Verizon
Jay Carpenter	1-800 AFTA
Andrew Gallant	AG Design, LLC
Steven D. Lind	AT&T
Penn Pfautz	AT&T
Doug Birdwise	Bell Canada
Ken Buchanan	BellSouth
Mark McFadden	BT Americas
Tim Denton	CIRA
Chip Sharp	Cisco
Tom Creighton	Comcast
Jason Livingood	Comcast
Suzanne Howard	COX
Beth O'Donnell	COX
Tim Ruiz	GoDaddy.com
Judith Oppenheimer	ICB
Blaine Elzey	Lucent
Doug Rollender	Lucent
Ron Santos	Lucent
Karen Mulberry	MCI
Robert Schafer	MCI
Alan Johnston	MCI
Richard Shockey	NeuStar
Mike St. Johns	Nominum
Bernie Ku	SBC Labs
Phyllis Anderson	SBC Labs
Jim Danda	Sprint
Mir Islam	Sprint
Hala Mowafy	Telcordia
Kaj Tiesink	Telcordia
Kevin McCandless	Verisign

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Technical and Operational Requirements for an ENUM Tier 1A Registry for Country Code 1

1. SCOPE, PURPOSE, AND APPLICATION

1.1 Scope

This document describes the technical and operational requirements for an ENUM Tier 1A Registry for Country Code 1 (CC1) under the ITU-T E.164 international numbering standard.

Tier 1A is a single Internet domain name system (DNS) zone intended to be common to all nations that share country code 1 of the ITU-T E.164 international numbering standard.

The registry for the Tier 1A zone will be used as the registry (the *root*) for all North American Numbering Plan (NANP) Numbering Plan Areas (NPA), such as 202, 613, 800, 866, 900, etc.

Tier 1A will be used to register both geographic NPAs, that is NPAs better known as Area Codes, but shall also be capable of supporting non-geographic resources such as toll free and caller-pays 900 services.

1.2 Purpose

This document is intended to provide the specifications necessary to implement the components for ENUM for geographic Numbering Plan Area resources within the Country Code 1. It should provide sufficient information to allow a contracting entity to put out a request for proposal to business organizations in the industry. As such, it describes, among other things, the reference architecture for the Tier 1A portion of ENUM, the operational and administrative aspects of the Tier 1A Registry, and the provisioning process. It also addresses the critical security and privacy issues inherent in implementing this system.

The immediate audience of this document is comprised of CC1 ENUM LLC, ENUM Forum members, Canadian Steering Committee on Numbering members, NTIA, FCC, Industry Canada, Canadian Radio-television and Telecommunications Commission (CRTC), CIRA, national numbering administrations for NANP member countries and all other stakeholders such as potential users of ENUM. This document is being distributed to all stakeholders with a view to seeking consensus amongst an audience that is as large as possible, with a view of ensuring that the implementation of ENUM CC1 Tier 1A proceeds as swiftly and as smoothly as possible.

1.3 Application

This document is intended to serve as a basis for establishing consensus for preparing a memorandum of understanding between the industry and government entities in Country Code 1, with a view to preparing the request for proposals for the management of Country Code 1 in ENUM and the ultimate selection of the vendor that shall provide Country Code 1 Tier 1A services.

2. REFERENCES

The following references contain provisions that are incorporated by reference to this specification. At the time of publication, the editions indicated were valid. All documents are subject to revision, and

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parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the references indicated below.

[1] [Falstrom, P., Mealling, M., "The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)", RFC 3761, April 2004.

[2] Eastlake, D., "Domain Name System Security Extensions", RFC 2535, March 1999.

[3] Crocker, D., "Standard for the format of ARPA Internet text messages", STD 11, RFC 822, August 1982.

[4] Rivest, R., "The MD5 Message-Digest Algorithm", RFC 1321, April 1992.

[5] Mockapetris, P., "Domain names - concepts and facilities", STD 13, RFC 1034, November 1987.

[6] Mockapetris, P., "Domain names - implementation and specification", STD 13, RFC 1035, November 1987.

[7] Mockapetris, P., "DNS encoding of network names and other types", RFC 1101, April 1989.

[8] Elz, R. and R. Bush, "Clarifications to the DNS Specification", RFC 2181, July 1997.

[9] Elz, R., Bush, R., Bradner, S. and M. Patton, "Selection and Operation of Secondary DNS Servers", BCP 16, RFC 2182, July 1997.

[10] Bradner, S., "The Internet Standards Process -- Revision 3", BCP 9, RFC 2026, October 1996.

[11] Eidnes, H., de Groot, G. and P. Vixie, "Classless IN-ADDR.ARPA delegation", BCP 20, RFC 2317, March 1998.

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[14] M. Ohta, "Incremental Zone Transfer in DNS," RFC 1995, August 1996.

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[16] P. Vixie, S. Thomson, Y. Rekhter, & J. Bound, "Dynamic Updates in the Domain Name System (DNS UPDATE)," RFC 2136, April 1997.

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[18] M. Crawford & C. Huitema, "DNS Extensions to Support IPv6 Address Aggregation and Renumbering," RFC 2874, July 2000.

[19] D. Eastlake 3rd, "DNS Request and Transaction Signatures (SIG(0)s), " RFC2931, September 2000.

[20] R. Bush, D. Karrenberg, M. Kosters, & R. Plzak, "Root Name Server Operational Requirements," RFC2870, June 2000.

[21] Arends, R. et al, "DNS Security Introduction and Requirements," RFC2870", RFC4033, March 2005

[22] Arends, R. et al, "Resource Records for the DNS Security Extensions", RFC4034, March 2005

[23] Arends, R. et al, "Protocol Modifications for the DNS Security Extensions", RFC4035, March 2005

[24] Vixie, P., "Extension Mechanism for DNS (EDNS0)", RFC2671, June 1999

[25] Crawford, M., "Non-Terminal DNS Name Redirection", RFC2672, August 1999

[26] Thomson, S. et al, "DNS Extensions to Support IP Version 6", RFC3596, October 2003

[27] Eastlake, D. 3rd, "DNS Request and Transaction Signatures (SIG(0)s)", RFC2931, September 2000.

3. DEFINITIONS, ACRONYMS, & ABBREVIATIONS

3.1 Definitions
ENUM

ENUM is a protocol developed in the Internet Engineering Task Force (IETF) (initially in RFC 2916 superseded by RFC 3761) whereby the "Domain Name System (DNS) can be used for identifying available services connected to one E.164 number."

3.2 Acronyms & Abbreviations

CC1	Country Code 1
CIRA	Canadian Internet Registration Authority
CNNP	Cross Network Name Server Performance
CRTC	Canadian Radio-television and Telecommunications Commission
DNS	Domain Name System
DNSSEC	DNS Security Extensions
FCC	Federal Communications Commission
FTP	File Transfer Protocol
HVAC	Heating, Ventilating, and Air Conditioning
IETF	Internet Engineering Task Force
ITU-T TSB	International Telecommunication Union – Telecommunication Standardization Sector, Telecommunication Standardization Bureau
NANP	North American Numbering Plan
NANPA	North American Numbering Plan Administrator
NPA	Numbering Plan Area
NAPTR	Naming Authority Pointer
NS	Name Server
NTIA	National Telecommunications and Information Administration
PoP	Point of Presence
RFC	Request for Comments
RIPE NCC	Réseaux IP Européens Network Coordination Centre
SCP	Secure Copy
SRS	Shared Registration System
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
URI	Universal Resource Identifier
WWW	World Wide Web

4. INTRODUCTION

This section specifies the reference architecture of a single common ENUM DNS domain, 1.e164.arpa, within Country Code 1.

ENUM implementation is based on a tiered architecture as shown in Figure 1. At Tier 0 is the RIPE NCC, which maintains the e164.arpa zone.[1] Entries in the RIPE NCC name servers correspond to country codes and point to the name servers of the Tier 1 Registry that is authoritative for that country code. Entries in Tier 1 Registries normally correspond to individual telephone numbers and point to the Tier 2 name servers that hold the NAPTR records used to provide actual communication services.

Because Country Code 1 corresponds to an integrated numbering plan in which the country code is shared among several nations, the plan of the CC 1 ENUM LLC is to split Tier 1 functionality into a Tier 1A, which would receive the CC1 delegation from the Tier 0, and potentially multiple Tier 1Bs serving different CC1 (NANP) member states. Entries in Tier 1 A will correspond to NPAs and will point to the Tier 1B that holds per -number delegations for the numbers within the given NPA.

Tier 1 B Registries are required to deal directly with the CC1 ENUM Tier 1A Registry to arrange for the provisioning of NS records for the NPAs they serve into the CC1 ENUM Tier 1A Registry. The detailed technical requirements for the Tier 1B are contained in a separate document developed by the CC1 ENUM LLC Technical Advisory Committee.

CC1 ENUM Tier 1B registry(ies) will be required to establish a business relationship with the CC1 ENUM Tier 1A Registry prior to registering any NPA in e164.arpa. The nature of the business relationship will be defined by the contracting entity, embodied in a Registry agreement, and will be the same for all CC1 ENUM Tier1B registry(ies). This is necessary to ensure that each CC1 ENUM Tier 1B registry's records are properly maintained and that only the assignee of the NPA which has been designated to participate in ENUM by the national administration in charge of the NPA in question can register it into Tier 1A.

ENUM Registrars, the entities that accept registration requests from number assignees, will, in turn, be required to establish a business relationship with the CC1 ENUM Tier 1B registry(ies) prior to registering any telephone number, in e164.arpa. The nature of the business relationship between the Tier 1B and the ENUM registrars will be defined by the contracting entity, embodied in a Registry agreement, and will be the same for all ENUM Registrars for a given NPA entered into Tier 1A. This is necessary to ensure competitive equity between registrars in Tier 1B and to ensure that ENUM Registrant's records are properly maintained and that the assignee of the E.164 telephone number has decided to participate in ENUM.

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[1] The instructions regarding operations of the domain e164.arpa can be found at the URL: http://www.ripe.net/rs/enum/instructions.html

The ITU-T TSB evaluates delegation requests. Information on how TSB will handle ENUM requests can be found under the bullet "Interim Procedures" at the ITU-T Web site at: http://www.itu.int/ITU-T/inr/enum/
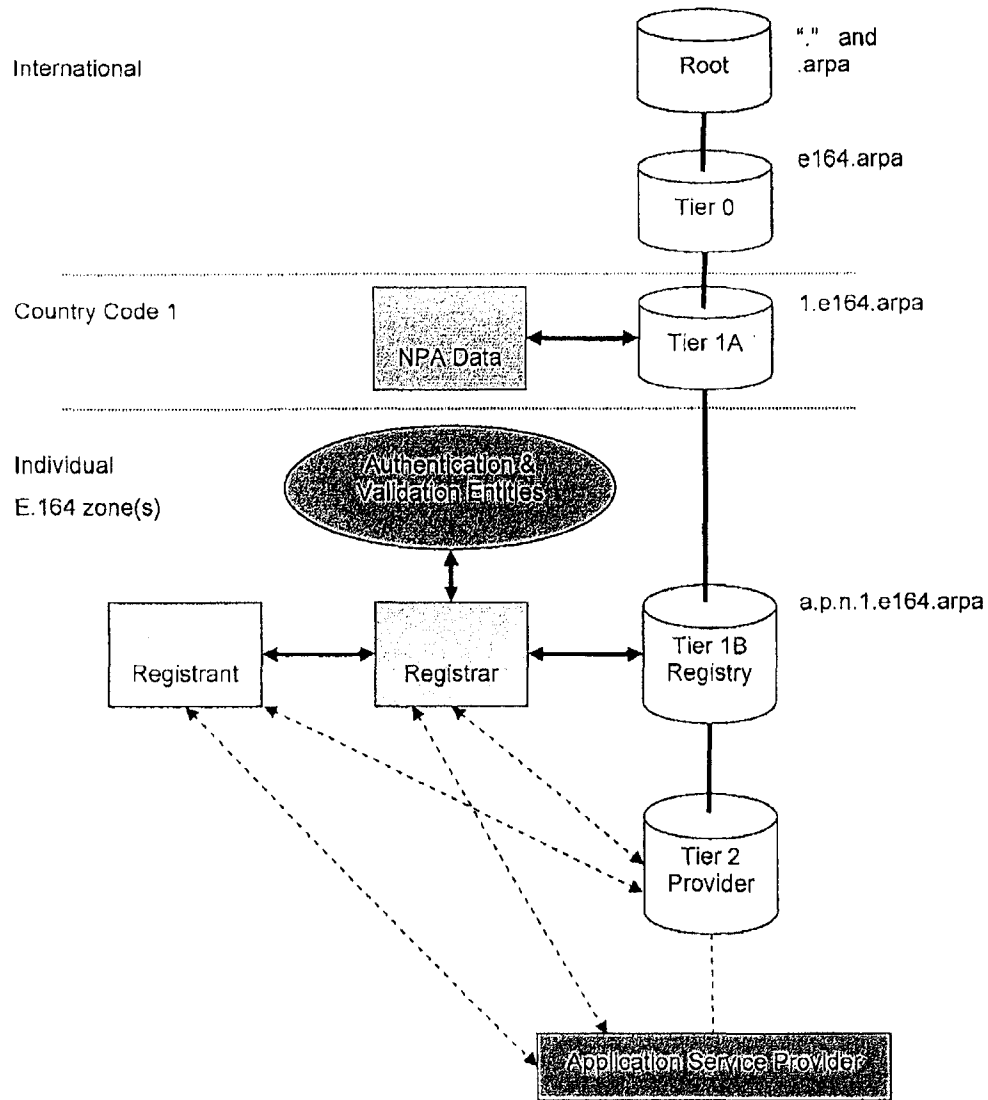
Figure 1 - ENUM Functional Architecture

The Tier 2 Provider for an E.164 number maintains the actual NAPTR records that contain URIs (Universal Resource Identifiers) for specific communication services, and the Application Service Provider uses these records to provide those services to the number assignee (the Registrant.)

5.   OPERATIONAL & INFRASTRUCTURE REQUIREMENTS

This section provides requirements for the operation and infrastructure of the ENUM Tier 1A registry. Service Level Requirements are contained in Section 6.

5.1   Tier 1A Registry Operation

This section specifies the technical requirements for the operations of a Country Code 1 Tier 1A Registry.

A Tier 1A Registry will maintain the addresses of the name servers of the Tier 1B registries in Country Code 1 that national authorities for the respective Tier 1B registries have authorized. The Tier 1A Registry shall:

- Check with NANP Administration to identify the nation to which the NPA has been allocated and verify that the party making the request is authorized to act in that capacity by its national authority.
- Provide procedures that will allow the Tier 1B operators to manage the records for their NPAs in the Tier 1A registry.

The Registry shall also have the capability to maintain the addresses of the Tier 1B name servers for the non-geographic NPAs, such as 800, 888, etc. and allow the corresponding Tier 1B operator(s) to manage records for such NPAs. Based on guidance from NANP member nations, the CC1 ENUM LLC will inform the Registry as to the Tier 1B for a given non-geographic NPA.

5.1.1   Registry Database

The Registry database is the central repository for all objects concerning ENUM domain name registrations in an ENUM Tier 1A Registry. The three primary objects associated with a Tier 1 registration are: domain, host, and contact. It is critical that a Registry database operate in a responsive and robust manner.

A Tier 1A Registry should describe how it would meet the following requirements for an ENUM Registry database.

A Registry database:

- Shall be sized to accommodate the expected demand at initial launch, and to support growth without interruption as ENUM matures.
- Shall be able to perform transactions at a rate that meets the needs of the Tier 1B Registries.
- Shall maintain its performance based on agreed to service-level measurements, even as the number of users, workload volume, or database size increases.
- Shall maintain a high level of availability. Tier 1A candidate should describe what level of availability it believes is necessary; what amount of scheduled maintenance is necessary; and how it would expect to meet the appropriate availability level.
- Shall be replicated and hosted in geographically dispersed data centers to achieve high availability and facilitate data backup and recovery. Because the Tier 1A registry will likely contain fewer than a thousand records and additions and changes are expected to be infrequent, a mechanized interface or system (Shared Registration System) between Tier 1Bs and the Tier 1A should not be required. However, transport of records between the Tier 1Bs and Tier1As shall be via a secure methodology. If and when the CC1 ENUM LLC elects to require

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implementation of DNSSEC, the Tier 1A Registry must revise the interface accordingly and, thus, may want to plan for this circumstance in the initial design.

5.1.2   Zone Data

Zone data consists of the technical information that the DNS requires to function correctly. Zone data generation, or zone data propagation, is the term traditionally used to describe the process of generating zone information from the Registry database and deploying the data to the DNS database

The Tier 1A registry shall meet the following requirements for zone operations:

- Provide a means to generate the zone data from the Registry database to the DNS database to timely reflect any changes as defined in the Service Level Requirements.
- Reliably and securely propagate the zone data to all Tier1A name servers with minimum delay.
- The frequency of zone data generation and the delay of zone file propagation shall meet the needs of the ENUM users.
- Zone data generation and propagation procedures shall be carefully engineered so that they will not adversely affect the normal Registry and name server operations.
- Zone data distribution procedures shall conform to appropriate IETF standards.
- There shall be at least four geographically dispersed (separated by at least 200 miles) name servers for an ENUM Tier 1A Registry.
- At least two of the Tier 1A name servers must be located within the United States.

5.1.3   Contact Info

The Tier 1A Registry shall make publicly available contact information (Contact name or title, email address, phone, fax, organization and organizational entity, etc.) for the Tier 1B Registries associated with each NPA, for instance, on a web page.

5.1.4   Reports and Files

An ENUM Tier 1A Registry shall provide reporting service to allow ENUM Tier 1B Registries to retrieve reports on performance statistics for resolving the entries in Tier 1A. In addition, it may also make available complete NPA zone file to appropriate entities as defined by the CC1 ENUM LLC.

A Tier 1A Registry shall provide appropriate reporting capabilities for national authorities, Tier 1B Registries and the CC1 ENUM LLC, including, at a minimum, registry performance and zone data transactions. It shall maintain transaction logs for this purpose.

5.1.5   Database Escrow and Backup

The goal of any data backup/recovery procedure is full recovery from failures without any loss of data. Data backup strategies handle system hardware failures (e.g., loss of a processor or one or more disk drives) by reinstalling the data from daily backups, supplemented by the information on the "before" and "after" backup files that the database creates. In order to guard against loss of the entire facility because of fire, flood, or other natural or man-made disaster, off-site escrow of the Registry data should be provided in a secured storage facility.

A Tier 1A candidate shall specify:

- The frequency and procedures for data backup
- The frequency and procedures for data escrow
- The hardware and software systems used for data backup
- The procedures for retrieval of data and rebuild of the database

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- Who should have access to the escrowed data and in what circumstances it would be accessed by an entity other than itself
- How escrow and back-up data will be used for recovery

In addition, the following safeguards are required of the Tier 1A registry:

- The data backup and escrow procedures shall not impede the overall performance of normal Registry operations
- The data backup and recovery procedures shall minimize the data loss and service interruption of the Registry

5.1.6 Network Operations and Maintenance

ENUM is envisioned as a completely robust and high-availability service. The Tier 1A shall operate and maintain the various aspects of the Registry to a high service level. Bidders should include descriptions of how they intend to ensure system outage prevention, system recovery procedures, and technical support, including arrangements for power, HVAC (Heating, Ventilating, and Air Conditioning), and fire systems.

5.1.7 System Outage Prevention

The Tier 1A Registry requires outage prevention measures specifically designed to minimize system component downtime. Downtime can be either unplanned, which is caused by failures in external telecommunications, power, or internal network or computer equipment; or planned, which occurs when the system is unavailable due to scheduled maintenance (e.g., during software or hardware upgrades and system backups).

A Registry shall:

- Use redundancy and high-availability system architectures to eliminate planned downtime of the whole system. That is, the Registry service shall remain operational when part of the system is undergoing software or hardware upgrades and system backups.
- Use redundancy and high-availability system architectures to minimize individual server unplanned downtime.
- Employ a comprehensive set of system monitoring procedures for problem detection and resolution at multiple levels of the architecture, including processor, memory, operating system, database, application process, and network connectivity.
- Make available backup software, operating systems, and hardware in all data centers.
- Employ a streamlined technical support process to ensure that the appropriate staffs resolve all problems in a timely manner
- Incorporate appropriate geographic and network diversity in its architecture
- Track and report any outage planned or unplanned which prevents any server from answering a query.

5.1.8 System Recovery Procedures

System recovery refers to the process of bringing the system back to normal operations after the system has gone down due to failures. The goal is to minimize downtime, data loss, and adverse impacts on other systems.

The Tier 1A registry shall meet the following operations and maintenance requirements:

- Employ recovery procedures for failures that occur at different parts of the Registry system, such as:
  o Data center failures
  o Database failures

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- o Server failures
- o Network failures
- o Active and Passive attacks

In addition, a Registry should:

- Provide a time estimate for recovering from each type of failure.
- Log each system outage and document system problems that could result in outages.

5.1.9 Technical and Other Support

The Tier 1A Registry must act as technical liaison with Tier 0 for resolution of issues with respect to the delegation of authority over 1.e164.arpa in CC1.

The Tier 1A Registry must provide technical and other support to the Tier 1B Registries from an appropriate customer help desk with a well-defined escalation policy.

5.2 Domain Name System Requirements

The Tier 1A Registry must comply with relevant IETF RFCs and best practices including specifically RFC 2870. The bidder must identify other relevant RFCs with which it complies.

5.3 Security

A Tier 1A must secure both Registry operations and data. A Registry shall conduct comprehensive threat analyses on all parts of the Registry system to identify the vulnerable points and the types of security attacks. Based on the analyses, the Registry shall define and implement multi-tiered procedures that provide security protections to all parts of the Registry system

5.3.1 Operational System Security

- Protection/Prevention of compromise of the systems hosting or managing Tier 1A
- Protection from Denial of Service attacks (internal & external)
- Requirements for maintaining security updates for all software
- Security (integrity, authenticity) of communications between the components of the Tier 1A and 1B service (name servers, registry, etc)
- Encryption requirements
- Authentication & Authorization requirements
- Requirements on ISPs providing connectivity for Tier 1A

5.3.2 Physical Security

- The Tier 1A Registry shall employ a variety of physical security systems to ensure that unauthorized personnel have no access to sensitive equipment and/or data.

- All servers containing any sensitive data shall be physically secured so that only a controlled list of people can obtain access.

- The hosting centers shall be secured so that no access to the internal networks is possible for unauthorized persons. All internal networks shall be isolated from public access, and external Internet links shall be firewall-protected to prevent intruders from gaining access.

- Physical precautions inside the server rooms shall include movement detectors (using infra-red or similar means) to alert security personnel should an intruder gain access to a secured

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location. Alarms will be fitted to all doors and windows, which open into or out of a restricted area.

- The doors and windows shall be secure enough to withstand a reasonable amount of force, and damage to doors or windows shall also trigger the alarms.

- Security staff shall be present at all times, and should have sufficient training to enable them to correct most problems. Appropriate personnel shall also be contacted when necessary to help contain the situation.

- Access to the server room shall be controlled by a two-factor authentication system. An authorized individual shall require both an authorized access token and a valid PIN or passcode to gain physical access to the servers. Any use of an access token shall be logged and such logs shall be archived for at least 1 year.

- Should an access card be lost or stolen, it is the responsibility of each employee to report this in a timely manner so that the lost card may be deactivated and a new card issued. Closed circuit TV shall be in place at all sites for identification purposes should an unauthorized person attempt to use a stolen access card. Personnel authorized temporary access to the servers, but not permanently issued access tokens, shall be escorted by permanent staff while within the restricted space.

- 24-hour access to the data center by authorized personnel shall not be hindered by aforesaid security measures.

5.3.3 Network Security

- User identification, passwords, and IP range checking shall be required for all restricted services (which includes services other than DNS resolution.).

- Secure File Transfer Protocols shall be used for all "file transfers" between the ENUM Tier 1Bs and the Tier 1A Registry [RFC 2228, RFC 2577, or similar equivalent].

- System maintenance shall be performed via SSL or similarly secured connections. Telnet servers shall not be operational on any system on the DNS network due to their security risk.

- Each system shall operate a very restricted set of basic services in the relevant sections for DNS, ContactInfo, FTP, SCP, and WWW services. Systems shall be firewall-protected in hardware, and IP filtering rule sets shall be in place to reject packets that are not appropriate for a particular host.

- DNS servers shall run a minimum set of applications and system services, in addition to the DNS server software.

- Checks shall take place on all DNS servers to ensure that data integrity is maintained.

- Services which are IP-restricted shall have each IP address specified individually. Network addresses are not to be used, since this adds the risk that a host could masquerade as a spare IP address on an internal network.

- Packet "sniffers", designed to check all traffic passing through a network interface, shall be in place to catch suspicious traffic. These will actively scan for incorrect or illegal packets, and alert the security team. Packet sniffers may also give some indication of the source of an attack, which would be of use in preventing that attack in the future.

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- Network security shall be verified by a security audit process, which involves scanning from an internet-connected host all TCP and UDP ports on servers operated by the Tier 1A Registry.

- Security tests shall be performed on the DNS Servers and a corresponding report audited on a regular basis. Each test will attempt to take advantage of a security flaw using a specific attack method, and the result shall be reported. Here is an non-exhaustive list of known attacks:
  - o   Buffer overflow exploit
  - o   Missing format string exploit
  - o   Packet fragmentation attack
  - o   Data flooding (SMURF ping, etc.)
  - o   DNS spoofing
  - o   FTP spoofing
  - o   Dictionary passwords
  - o   Replay attack
  - o   Denial of service (DoS)

Some of these attacks may not be applicable to all services.

The Tier 1A Registry shall update the tests used when new vulnerabilities, security flaws, or techniques are discovered. The updates shall be based on information from security-related mailing lists, websites, newsgroups, and industry best practices.

5.3.4   Backup Security

- Backup shall be performed through a secure network on the main Tier 1A Registry site.

- The Tier 1A Registry shall use an encryption scheme for the backup of sensitive data as a part of the implementation process.

- Backup information shall be stored in a secure off-site location.

5.3.5   Security Audit and Reporting

The Tier 1A Registry shall run a security audit on a regular basis but no less often than once per quarter.

- The Tier 1A Registry shall run a security audit to test all systems for configuration issues and security vulnerabilities. Results of this audit should then form the basis of a quarterly security audit report, which will also detail any recommendations for system alterations and a timeline for remediation.

- All security breaches are to be reported to the Registry management responsible for security and to the CC1 ENUM LLC. Should a serious breach be detected, some services may be suspended temporarily if this is necessary to ensure the reliability of the Tier 1A Registry data. Bidders should detail the hierarchy of breach severity and escalation procedures.

- The Tier 1A Registry shall provide a monthly security status report to the CC1 ENUM LLC, including a list of security incidents categorized by severity.

5.4   *Other Responsibilities of the Tier 1A Registry*

The Tier 1A Registry will use commercially reasonable efforts to restore the critical components of an affected Tier 1A Registry site within 48 hours in the case of a *force majeure* event. No single event shall result in an outage of DNS resolution service itself.

The Tier 1A Registry will perform internal monitoring as a means to verify that the availability and performance measurements of this document are being met. In the case of name server performance requirements, a mutually agreed upon third party verification entity will be used.

Beginning no later than 120 days after the commencement-of-service date, the Tier 1A Registry will provide monthly system performance and availability reports to the contracting entity, subject to the determination of the contents of the report by the contracting entity.

The Tier 1A Registry will provide service availability percentages during each Performance Measurement Period as listed in this document.

5.5   Transition Requirements

The Tier 1A Registry must provide a plan for transitioning of the Registry to a new provider within the timeframe set forth in the terms and conditions in the Registry contract. The plan must ensure no disruption of ENUM DNS service.

6.   SERVICE LEVEL REQUIREMENTS

The Tier 1 Registry shall use commercially reasonable efforts to provide performance at the levels set forth herein.

- 100 percent availability for resolution services
- 100 percent accuracy of the zone file

6.1   Service Availability

Service Availability is measured as follows:

Service Availability % = {[(MTM - POMU) - UOM] / (MTM - POMU)}*100 where:

> MTM = Monthly Timeframe Minutes calculated as the number days in that month times 24 hours times 60 minutes. For example, the MTM for January is 31 days * 24 hours * 60 minutes or MTM = 44,640 minutes.

> POMU = Planned Outage Minutes Used is the number of minutes of a Planned Outage or Extended Planned Outage Used for that Monthly Timeframe for each individual System Service. No Monthly Timeframe shall have both a Planned and an Extended Planned Outage.

> UOM = Unplanned Outage Minutes

The Service Availability calculation shall be calculated by the Registry Operator and the results reported for each Monthly Timeframe for DNS Name Server availability. Results will be reported to the Tier 1B Community via e-mail and to CC1 ENUM LLC.

Service Availability—DNS Name Service = 100% per calendar month. Service Availability as it applies to the DNS Name Server refers to the ability of the DNS Name Server to resolve a DNS query from an Internet user.   DNS Name Service unavailability will be logged with the Registry Operator as Unplanned Outage Minutes. Registry Operator will log DNS Name Service unavailability when such unavailability is detected by monitoring tools, or once Tier 1B reports an occurrence to Registry Operator's customer service help desk in the manner required by the Registry Operator (i.e., e-mail, fax, and telephone) and Registry Operator confirms that the occurrence is not unique to the reporting Tier 1B.   DNS Name Service unavailability shall mean when greater than 25% of sites on the Registry

Operator's constellation are returning answers to queries with more than 1% packet loss averaged over a Monthly Timeframe or 5% packet loss for any five minute period. The committed Service Availability for DNS Name Server is 100% per calendar year.

Planned Outage – For DNS resolution service no Planned Outages are allowed.

6.2   Processing Time

Processing time is an important measurement of transaction-based services like the System Services. Service Availability, including Planned Outages and Extended Planned Outages, measures the amount of time that the service is available to its users. Processing time measures the quality of Service Availability.

Processing Time refers to the Round-trip for the System Services ("Processing Time"). Since each of the System Services has a unique function the Performance Specifications Processing Times are unique to each System Services. Processing Time Performance Specifications will be measured in a Monthly Timeframe and will be reported on a monthly basis to the CC1 ENUM LLC.

Processing Time—DNS Name Server Resolution ≤ 100 milliseconds for 95%. Bidders should provide sufficient detailed justification for any proposal that does not meet this requirement.

> a) Processing Time - DNS Name Server Resolution is applicable to the DNS Name Server. It measures the processing time for a DNS query.

> b) The Performance Specification is 100 milliseconds for 95% of the transactions. That is, 95% of the transactions during a Monthly Timeframe will take 100 milliseconds or less from the time name server receives the DNS query to the time it provides a response.

6.3   Update Latency

The Registry Operator makes timely updates to the data on the DNS Name Servers in response to requests from the Tier 1B Registries. The Tier 1A Registry Operator processes these updates on a near real time basis. This is measured from the time that the registry verifies the update request to the time the update appears in the DNS Name Server. Update latency performance will be reported on a monthly basis.

During normal business hours, the Tier 1A Registry shall implement authorized changes (e.g., change to or addition of an NS record for an existing assigned NPA) requested by Tier 1B registries within 15 minutes. The Registry shall also provide procedures for emergency out-of-hours changes.

6.4   Cross-Network Name Server Performance (CNNP) Requirements

DNS Name Server Round-trip and packet loss from the Internet are important elements of the quality of service provided by the Registry Operator. These characteristics, however, are affected by Internet performance and, therefore, cannot be closely controlled by Registry Operator. The committed performance specification for cross-network name server performance is a measured Round-trip of under 300 milliseconds and measured packet loss of under 1% averaged over the course of a Monthly Timeframe and no greater than 5% for any five (5) minute period over the course of a Monthly Timeframe. Cross-network name server performance measurements may be conducted by the CC1 ENUM LLC at times of its choosing, in the following manner:

1) The measurements will be conducted by sending strings of DNS request packets from each of four measuring locations to each of the Tier 1A's DNS Name Servers and observing the responses from the Tier 1A's DNS Name Servers. (These strings of requests and responses are referred to as a "CNNP Test".) The measuring locations should be at least four geographically diverse sites.

2) Each string of request packets will consist of 100 UDP packets at 10-second intervals requesting name server (NS) records for arbitrarily selected Tier 1A domains, pre-selected to ensure that the NPAs exist in the Registry and are resolvable. The packet loss (i.e. the percentage of response packets not received) and the average round-trip time for response packets received will be recorded.

3) To meet the packet loss and Round-trip requirements for a particular CNNP Test, all three of the following must be true:

a) The Round-trip and packet loss from each measurement location to at least one Tier 1A name server must not exceed the required values.

b) The packet loss to each of the Tier 1A name servers from at least one of the measurement locations must not exceed the required value.

c) The Round-trip time to each of 75% of the Name servers from at least one of the measurement locations must not exceed the required value.

4) Any failing CNNP Test result obtained during an identified Core Internet Service Failure shall not be considered. "Core Internet Service Failure" refers to an extraordinary and identifiable event beyond the control of Registry Operator affecting the Internet services to be measured. Such events include but are not limited to congestion collapse, partitioning, power grid failures, and routing failures.

5) To ensure a properly diverse testing sample, the testing entity will conduct the CNNP Tests at varying times (i.e. at different times of the day, as well as on different days of the week).

6) In the event of persistent failure of the CNNP Tests (three or more consecutive failed tests), CC1 ENUM LLC will give Registry Operator written notice of the failures (with backup data) and Registry Operator will have sixty days to cure the failure.

7) Sixty days prior to the commencement of testing under this provision, CC1 ENUM LLC will provide Registry Operator with the opportunity to evaluate the testing tools and procedures to be used by testing entity. In the event that Registry Operator does not approve of such tools and procedures, the testing entity will work directly with Registry Operator to make necessary modifications.

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EXHIBIT 6

AGREEMENT TO PROVIDE TIER 1A SERVICES

THIS AGREEMENT, effective as of the ~~/4th~~ day of ~~February~~, 200~~5~~

BETWEEN:

CANADIAN INTERNET REGISTRATION AUTHORITY, incorporated under the laws of Canada and having its principal place of business at 350 Sparks Street, Suite 1110, Ottawa, Ontario, K1R 7S8, Canada and having a contact email address of enum.trial@cira.ca ("CIRA")

AND

COUNTRY CODE 1 ENUM LLC a company incorporated under the laws of Delaware and having its principal place of business at McKenna Long & Aldridge LLP, 1875 Lawrence Street, Suite 200, Denver, Colorado 80202 ("ENUM LLC")

WHEREAS the parties wish to set out the terms and conditions for an ENUM Trial (as defined in Paragraph 2(g) below.

NOW THEREFORE in consideration of the mutual promises and covenants herein contained (the receipt and sufficiency of which is hereby acknowledged by each party to this Agreement), the parties hereby covenant and agree as follow:

1. **Conduct of the ENUM Trial** - Subject to the terms and conditions hereof, the parties agree to conduct the ENUM Trial (defined in Paragraph 2(g) below) and to perform their respective services set out in the main body of this Agreement and in Schedule 1.

2. **Definitions** -

    (a) "CIRA" means the Canadian Internet Registration Authority, as further defined above.

    (b) "CIRA Deliverables" means the authoritative nameservers for the 1.e164.arpa zone provided by CIRA for the purposes of the ENUM Trial.

    (c) "Confidential Information" means information not publicly known or previously known by the receiving party, which is clearly marked at the time of disclosure as confidential or proprietary to either party hereto or is identified as such (with later written confirmation), which may include, without limitation, research, experimental work, trade secrets, computer programs, profitability, business plan, customer information, user information, and financial information.

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(d) "Contact Details" means the names of two contact persons for each Participant Representative (defined in Paragraph 2(m) and the telephone numbers and mailing and e-mail addresses, for each such person.

(e) "ENUM Information" means all information needed or requested by CIRA in order for CIRA to be able to provide the CIRA Deliverables, including, without limitation, (i) the NPAs assigned to the ENUM Trial within the Country Code 1 North American Numbering Plan for the Participants; (ii) hostnames of Tier 1B nameserver(s); and (iii) the Contact Details for each Participant Representative.

(f) "ENUM LLC" means Country Code 1 ENUM LLC, as further defined above.

(g) "ENUM Trial" means the ENUM trial within the Country Code 1 North American Numbering Plan, the terms and conditions of which are set forth in this Agreement, to test architectural, technical, operational and user experience aspects related to the provision of ENUM capabilities, as defined in IETF RFC 3761, and as further described in Schedule 1 attached hereto.

(h) "Material" means any and all intellectual property produced incident to the establishment or operation of the ENUM Trial, whether produced at the instance of ENUM LLC or at CIRA's own initiative, including any software, data, and any matter which is or may be subject to any patent, copyright, or mark registration.

(i) "NANP" means North American Numbering Plan.

(j) "National User" means any corporation, business, entity, organization, or company existing in a Participant country which chooses to participate in the ENUM Trial with the ENUM LLC.

(k) "NPA" means the Number Planning Areas.

(l) "Participant" means the United States and any other country within the Country Code 1 that chooses to participate in the ENUM Trial in cooperation with the ENUM LLC and CIRA. NANP member countries that elect to participate in the ENUM Trial separately from the ENUM LLC, shall not be considered "Participants" under this Agreement, and may contact CIRA directly with the required information in order to preserve the national sovereignty rights of each NANP member country.

(m) "Participant Representative" means that corporation, business, person, agent, entity, organization, or company, that the Participant designates as its representative to interact with CIRA and the ENUM LLC, and that is authorized to act on behalf of the Participant for purposes of the ENUM

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Trial. The Participant may choose the ENUM LLC as its Participant Representative.

3. **Obligations of CIRA**

(a)   CIRA shall provide the CIRA Deliverables.

(b)   CIRA shall delete and promptly destroy all ENUM Trial data contained in the CIRA nameservers, and shall provide written certification of such deletion and destruction to the ENUM LLC, no later than thirty (30) days after completion of the ENUM Trial or termination of this Agreement.

(c)   During the ENUM Trial, CIRA shall provide a periodic status report to the ENUM LLC upon request, and shall document and present a report of its findings to the ENUM LLC at the end of the ENUM Trial or upon termination of this Agreement.

(d)   CIRA shall comply with all applicable law in performing its obligations hereunder, including with respect to each of its actions, as required, performed or directed by it, whether directly or indirectly.

4. **Obligations of ENUM LLC**

(a)   ENUM LLC shall provide the ENUM Information to CIRA.

(b)   ENUM LLC shall act as the primary point of contact for the Participants, through their Participant Representatives, as well as for the National Users and CIRA.

(c)   ENUM LLC represents, warrants and covenants to CIRA as follows and acknowledges that CIRA is relying upon such representations, warranties and covenants in entering into this Agreement and performing its obligations under this Agreement, that:

(i)   all ENUM Information, including the Contact Details, provided to CIRA at any time during the ENUM Trial, is accurate to the best of ENUM LLC's knowledge, information and belief;

(ii)   CIRA has the right to publish the relevant ENUM Information in the DNS for the trial period;

(iii) it hereby delegates to CIRA all necessary authority, to the extent required for CIRA to perform its obligations hereunder;

(iv)   it shall make any necessary corrections to rectify any errors in ENUM Information submitted to CIRA as soon as it becomes aware of same; and

(v)   it shall comply with all applicable law in performing its obligations hereunder, including with respect to each of its actions, as required, performed or directed by it, whether directly or indirectly.

5.   **CC 1 Delegation** – CIRA and ENUM LLC agree to request the Participants to seek a temporary delegation of CC 1 to ENUM LLC for a one year period or until the termination of this Agreement, whichever is earlier, pursuant to the procedures as set forth at http: www.xxxxx 777.77 xxx enum procedures xxx entitled the "ENUM administration *ad interim*".

6.   **Costs** – The parties agree that each party, in all events, shall be responsible for its own costs and expenses of participating in, and otherwise associated with, the ENUM Trial and for satisfying its own obligations pursuant to this Agreement. Neither compensation nor direct financial benefit in relation to this Agreement are required or foreseen for or by any party to this Agreement.

7.   **Publication** – Neither party is permitted to directly or indirectly refer to the other party in any press release, public announcement, or any other similar public communication without the explicit written consent by the party who is directly or indirectly referred to in the press release, public announcement, or other similar public communication, such consent not to be unreasonably withheld, conditioned, or delayed.

8.   **Term & Termination**   This Agreement shall be deemed to have come into force and effect as of the date first written above and shall continue in effect until (i) the expiration of the ENUM Trial (as set out in Schedule 1), or (ii) if no expiration date is set out in Schedule 1, twelve (12) months from the effective date first written above, unless earlier terminated by either party, upon 90 days' prior written notice.

9.   **Warranties**   THE CIRA DELIVERABLES AND ALL SERVICES PROVIDED BY CIRA ARE PROVIDED "AS IS" AND WITHOUT WARRANTY OR CONDITION, WHETHER EXPRESS OR IMPLIED, OF ANY KIND.   CIRA MAKES NO WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS OF ITS OWN, AND THERE ARE NO OTHER WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS, ORAL OR WRITTEN, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, OF ANY KIND WHATSOEVER WITH RESPECT TO THE CIRA DELIVERABLES OR THE CIRA SERVICES PROVIDED HEREUNDER, INCLUDING AS TO THEIR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, DESIGN OR CONDITION, COMPLIANCE WITH THE REQUIREMENTS OF ANY CONTRACT OR SPECIFICATION, NON-INFRINGEMENT OF THE RIGHTS OF OTHERS, OR ABSENCE OF LATENT DEFECTS; AND THOSE ARISING BY STATUTE OR OTHERWISE IN LAW, OR FROM A COURSE OF DEALING OR USAGE OF TRADE; AND ALL STATUTORY OR OTHER

WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS TO THE SAME OR ANY OTHER EFFECT RELATING TO ANY CIRA DELIVERABLES OR SERVICES PROVIDED HEREUNDER ARE HEREBY WAIVED BY THE PARTIES AND EXCLUDED TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAWS, AND ENUM LLC AGREES NOT TO SEEK OR CLAIM ANY BENEFIT THEREOF.

10. **No Liability** – REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT (EVEN IF FUNDAMENTAL BREACH), TORT, NEGLIGENCE, STRICT PRODUCT LIABILITY, OR OTHERWISE, UNDER NO CIRCUMSTANCES WILL EITHER PARTY (OR THEIR RESPECTIVE AFFILIATES, MEMBERS, DIRECTORS, OFFICERS, EMPLOYEES OR PROFESSIONAL ADVISORS) BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR EXEMPLARY DAMAGES, OR FOR ANY LOSS OF PROFITS, ANTICIPATED REVENUE, CUSTOMERS OR CONTRACTS, LOSS OF USE OF EQUIPMENT OR SOFTWARE OR LOSS OF DATA, SAVINGS OR GOODWILL, OR ANY COSTS (INCLUDING, WITHOUT LIMITATION, LEGAL FEES), EXPENSES, OR INTEREST RELATED THERETO, UNDER ANY THEORY OF LAW OR EQUITY, ARISING OUT OF OR IN ANY WAY RELATED TO THIS AGREEMENT, OR FOR ANY DAMAGES OF ANY TYPE CAUSED BY THE OTHER PARTY'S FAILURE TO MEET ITS RESPONSIBILITIES UNDER THIS AGREEMENT. THE LIMITATIONS OF WARRANTY AND LIABILITY IN THIS SECTION 10 SHALL APPLY WHETHER OR NOT THE ALLEGED BREACH, DEFAULT, NON-PERFORMANCE, FAILURE OR LIABILITY IS A RESULT OF A BREACH OF WARRANTY, CONDITION OR FUNDAMENTAL TERM, OR A FUNDAMENTAL BREACH AND SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT.

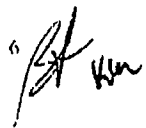11. **Intellectual Property** – The parties hereby agree that:

   (a) To the extent any Material is produced by either party as a consequence of this Agreement, such party shall grant to the other a nonexclusive, perpetual, royalty free license to use all such Material.

   (b) All findings and results generated by the ENUM Trial shall be considered to be materials in the public domain; provided, however, that this shall not include the user data, including Contact Details, provided by users and entered into the DNS and/or registry/registrar systems during the ENUM Trial which shall be protected pursuant to section 13 herein.

12. **Injunction** – Both parties acknowledge and agree that (a) given the nature of the subject matter of Sections 7, 8, 11, 13 and 14 and the potential consequences of a breach of such Sections, damages would be an inadequate remedy for such a breach; (b) in the event that the non-breaching party seeks an order for specific performance, a mandatory or prohibitory injunction or any other equitable relief in connection with such a breach, such non-breaching party will not be required to

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prove that damages are an inadequate remedy; and (c) the breaching party shall not, and hereby irrevocably waives any right it otherwise might have to, plead or in any other manner seek to rely on any contention that damages are or may be an adequate remedy for such a breach.

13. **Privacy and Data Protection** — The ENUM Trial shall be conducted in accordance with all applicable CCI privacy laws, including, but not limited to the federal *Personal Information Protection Electronic Documents* Act (Canada). At the end of the ENUM Trial, any personal information, as defined in the *Personal Information Protection Electronic Documents* Act (Canada), used during the ENUM Trial shall be promptly destroyed upon the completion of the purposes for which such personal information was collected, including, without limitation, all ENUM Trial data contained in the CIRA nameservers, and shall provide written certification of such deletion and destruction to the ENUM LLC no later than thirty (30) days after completion of the ENUM Trial or termination of this Agreement.

14. **Confidential Information** - Except as necessary to perform the obligations set forth in this Agreement or as specifically authorized by the disclosing party in writing, and except as required by law, the party receiving Confidential Information shall not use the Confidential Information or reproduce, use, distribute, disclose, or otherwise disseminate Confidential Information to a third party. Upon the expiration or termination of this Agreement, all Confidential Information in the receiving party's custody, control, or possession shall be destroyed by the receiving party, which shall promptly provide written certification of said destruction the disclosing party.

15. **Governing Law** — This Agreement shall be governed by and interpreted in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein, but excluding rules of private international law, if any, that would lead to the application of the laws of any other jurisdiction.

16. **Survival** — The following clauses shall forever survive the expiry or termination of this Agreement: Sections 7, 8, 9, 10, 11, 12, 13, 14, 15 and this Section 16.

17. **Assignment** —This Agreement is not assignable.

18. **Consistency** If the terms of the main body of this Agreement and the Schedule hereto differ, the main body of this Agreement shall govern to the extent of any such inconsistency.

19. **Entire Agreement** - The parties agree that this Agreement has been prepared by both parties and this Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof. It supersedes any other agreement or discussion, oral or written, express or implied. No provision of this Agreement, including the terms and conditions set forth in Schedule 1, may be

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changed or waived except by a written amendment signed by a signing officer of each party.

20. **Severability** - If any provision of this Agreement is declared by a court of competent jurisdiction to be invalid, illegal or unenforceable, such provision shall be severed from the Agreement and the other provisions shall remain in full force and effect.

The parties executed this Agreement on the date(s) set out below after having had the opportunity to discuss this Agreement with their legal advisors. Each party represents and warrants that its respective signatory is duly authorized to execute this Agreement on its behalf.

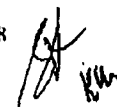CIRA: _____   CCI ENUM LLC: _____

By: _____   By: _____

Name: _B. TURCOTTE_____   Name: _Karen N. Mulberry_____

Title: _President & CEO___   Title: _Chairman_____

Date: _Feb 9 2005_____   Date: _Feb 9, 2005_____

Schedule 1

1. CIRA will, for the duration of the ENUM Trial, act as the Tier 1A Registry and operate the authoritative nameservers and zone files for 1.e164.arpa and as such CIRA will provide the following services in accordance with the Agreement:

   a) Publish the DNS zone 1.e164.arpa, delegating authority for its subdomains to the appropriate Tier 1B nameserver(s) as provided by ENUM LLC.

   b) Maintain at least two nameservers for the purpose of supporting 1 (a) of this Schedule 1.

2. a) Commercial and retail end users shall not be a part of the ENUM Trial; and

   b) Stress testing and performance testing shall not be part of the ENUM Trial.

3. General

   a) CIRA will not activate an NPA into the ENUM Trial without the written instructions from ENUM LLC to CIRA that ENUM LLC has obtained proper permission of the government responsible for that NPA.

   b) Each Participant will be assigned a temporary password which shall be sent by CIRA to the email address as provided by ENUM LLC for each Participant to CIRA.

   c) Upon confirmation and agreement by the Participant to CIRA's terms and conditions as set out below in Schedule 2, CIRA shall issue a permanent password and user id to the Participant to participate in the ENUM Trial.

   d) The ENUM Trial is limited to assigned geographic NPAs in the NANP serving area only, as defined in the Industry Numbering Committee (INC) NPA Allocation Plan and Assignment Guidelines that are assigned to the ENUM Trial.

   e) The results of the ENUM Trial may be used by the ENUM LLC to refine the CC1 ENUM technical requirements.

4. Term

   a) For each Participant the ENUM Trial shall run for a period of up to six months. The ENUM LLC and CIRA may agree to extend the ENUM Trial upon written confirmation by both parties.

   b) The ENUM Trial period shall commence on the day the CC1 delegation is received and shall terminate upon the receipt of the permanent CC1 delegation or at the end of twelve (12) full months, whichever is earlier.

Schedule 2

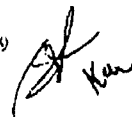**ENUM TRIAL PARTICIPANT AGREEMENT**

This agreement (the "Agreement") is between you (the "ENUM Trial Participant") and the Canadian Internet Registration Authority having a contact email address of enum.trial@cira.ca ("CIRA").

RECITALS

A.   The ENUM Trial Participant hereby wishes to participate in the ENUM trial within the Country Code 1 North American Numbering Plan to test architectural, technical, operational and user experience aspects related to the provision of ENUM capabilities, as defined in IETF RFC 3761 (the "ENUM Trial") The Enum Trial is further described in Appendix 1 attached hereto); and

B.   this Agreement sets forth the terms and conditions which govern the ENUM Trial and your participation thereof.

In consideration of the mutual promises and covenants herein contained (the receipt and sufficiency of which is hereby acknowledged by each party to this Agreement), the parties hereby covenant and agree as follows:

1.   **No Publication** - Neither party is permitted to directly or indirectly refer to the other party (or, in the case of the Participant, any other Participant) in any press release, public announcement, or any other similar public communication without the explicit written consent by the party who is directly or indirectly referred to in the press release, public announcement, or other similar public communication.

2.   **Term of Agreement** - This Agreement shall be deemed to have come into force and effect as of the time and date when the ENUM Trial Participant has indicated its consent to the terms and conditions hereby by clicking the "I Agree" button. It shall continue in effect for up to twelve (12) months or until either Party has terminated this Agreement by providing thirty (30) days written notice to the other Party, whichever is earlier. Notwithstanding the foregoing, in no event shall this Agreement continue beyond the end of the CC1 trial delegation period. Thirty (30) days prior to the end of the ENUM Trial, CIRA shall post a notice on its website and this Agreement shall be terminated upon the expiry of the notice.

3.   **Costs** – The parties agree that each party, in all events, shall be responsible for its own costs and expenses of participating in, and otherwise associated with, the ENUM Trial and for satisfying its own obligations pursuant to this Agreement. Neither compensation nor direct financial benefit in relation to this Agreement are required or foreseen for or by any party to this Agreement.

4.   **Warranties** – THE CIRA DELIVERABLES AND ALL SERVICES PROVIDED BY CIRA ARE PROVIDED "AS IS" AND WITHOUT

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WARRANTY OR CONDITION, WHETHER EXPRESS OR IMPLIED, OF ANY KIND. CIRA MAKES NO WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS OF ITS OWN, AND THERE ARE NO OTHER WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS, ORAL OR WRITTEN, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, OF ANY KIND WHATSOEVER WITH RESPECT TO CIRA DELIVERABLES OR THE CIRA SERVICES PROVIDED HEREUNDER, INCLUDING AS TO THEIR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, DESIGN OR CONDITION, COMPLIANCE WITH THE REQUIREMENTS OF ANY CONTRACT OR SPECIFICATION, NON-INFRINGEMENT OF THE RIGHTS OF OTHERS, OR ABSENCE OF LATENT DEFECTS; AND THOSE ARISING BY STATUTE OR OTHERWISE IN LAW, OR FROM A COURSE OF DEALING OR USAGE OF TRADE; AND ALL STATUTORY OR OTHER WARRANTIES, CONDITIONS, REPRESENTATIONS OR INDUCEMENTS TO THE SAME OR ANY OTHER EFFECT RELATING TO ANY THE CIRA DELIVERABLES OR SERVICES PROVIDED HEREUNDER ARE HEREBY WAIVED BY THE PARTIES AND EXCLUDED TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAWS, AND THE ENUM TRIAL PARTICIPANT AGREES NOT TO SEEK OR CLAIM ANY BENEFIT THEREOF.

5. **No Liability** – REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT (EVEN IF FUNDAMENTAL BREACH), TORT, NEGLIGENCE, STRICT PRODUCT LIABILITY, OR OTHERWISE, UNDER NO CIRCUMSTANCES WILL EITHER PARTY (OR THEIR RESPECTIVE AFFILIATES, MEMBERS, DIRECTORS, OFFICERS, EMPLOYEES OR PROFESSIONAL ADVISORS) BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR EXEMPLARY DAMAGES, OR FOR ANY LOSS OF PROFITS, ANTICIPATED REVENUE, CUSTOMERS OR CONTRACTS, LOSS OF USE OF EQUIPMENT OR SOFTWARE OR LOSS OF DATA, SAVINGS OR GOODWILL, OR ANY COSTS (INCLUDING, WITHOUT LIMITATION, LEGAL FEES), EXPENSES OR INTEREST RELATED THERETO, UNDER ANY THEORY OF LAW OR EQUITY, ARISING OUT OF OR IN ANY WAY RELATED TO THIS AGREEMENT, OR FOR ANY DAMAGES OF ANY TYPE CAUSED BY THE OTHER PARTY'S FAILURE TO MEET ITS RESPONSIBILITIES UNDER THIS AGREEMENT. THE LIMITATIONS OF WARRANTY AND LIABILITY IN THIS SECTION 5 SHALL APPLY WHETHER OR NOT THE ALLEGED BREACH, DEFAULT, NON-PERFORMANCE, FAILURE OR LIABILITY IS A RESULT OF A BREACH OF WARRANTY, CONDITION OR FUNDAMENTAL TERM, OR A FUNDAMENTAL BREACH AND SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT.

6. **Intellectual Property** – The parties hereby agree that:

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(a)   Any and all intellectual property produced incident to the establishment or operation of the ENUM Trial, whether produced at the instance of Country Code 1 Enum LLC ("ENUM LLC"), the Enum Trial Participant, or at CIRA's own initiative, including any software, data, and any other matter which is or may be subject to any patent, copyright, or mark registration shall be referred to as "Material." To the extent any Material is produced by either party as a consequence of this Agreement, such party shall grant to CIRA and to ENUM LLC a non-exclusive, perpetual, royalty free license to use all such Material.

(b)   All findings and results generated by the ENUM Trial shall be considered to be materials in the public domain; provided, however, that this shall not include the user data, including Contact Details, provided by users and entered into the DNS and/or registry/registrar systems during the ENUM Trial which shall be protected pursuant to section 8 herein.

7.   **Injunction** - The parties acknowledge and agree that (a) given the nature of the subject matter of Sections 1, 2, 6, 8, and 9 and the potential consequences of a breach of such Sections, damages would be an inadequate remedy for such a breach; (b) in the event that the non-breaching party seeks an order for specific performance, a mandatory or prohibitory injunction or any other equitable relief in connection with such a breach, such non-breaching party will not be required to prove that damages are an inadequate remedy; and (c) the breaching party shall not, and hereby irrevocably waives any right it otherwise might have to, plead or in any other manner seek to rely on any contention that damages are or may be an adequate remedy for such a breach.

8.   **Privacy and Data Protection** – The ENUM Trial shall be conducted in accordance with all applicable CC1 privacy laws, including, but not limited to the federal *Personal Information Protection Electronic Documents Act* (Canada). At the end of the ENUM Trial, any personal information, as defined in the *Personal Information Protection Electronic Documents Act* (Canada), used during the ENUM Trial shall be promptly destroyed upon the completion of the purposes for which such personal information was collected, but not later than thirty (30) days after the end of the CC1 trial delegation period.

9.   **Confidential Information** - "Confidential Information" means information not publicly known or previously known by the receiving party, which is either clearly marked at the time of disclosure as confidential or proprietary to either party hereto or is identified as such (with later written confirmation), which may include, without limitation, research, experimental work, trade secrets, computer programs, profitability, business plan, customer information, user information, and financial information. Except as necessary to perform the obligations set forth in this Agreement or as specifically authorized by the disclosing party in writing, and except as required by law, the party receiving Confidential Information shall not use the Confidential Information or reproduce, use, distribute, disclose, or otherwise disseminate Confidential Information to a third

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DX: 5031099K.1

party. Upon the expiration or termination of this Agreement, all Confidential Information in the receiving party's custody, control, or possession destroyed by the receiving party, which shall promptly provide written certification of said destruction the disclosing party.

10. **Governing Law** · This Agreement shall be governed by and interpreted in accordance with the laws of the Province of Ontario, and the federal laws of Canada applicable therein, but excluding rules of private international law, if any, that would lead to the application of the laws of any other jurisdiction. The courts of the Province of Ontario shall have the non-exclusive jurisdiction to hear any matter arising in connection with this Agreement.

11. **Survival** The following clauses shall forever survive the expiry or termination of this Agreement: Sections 1, 2, 4, 5, 7, 8, 9, 10, and this Section 11.

12. **Assignment** —This Agreement is not assignable.

13. **Consistency** – If the terms of the main body of this Agreement and the Schedule hereto differ, the main body of this Agreement shall govern to the extent of any such inconsistency.

14. **Entire Agreement** - The parties agree that this Agreement has been prepared by both parties and this Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof. It supersedes any other agreement or discussion, oral or written, express or implied. No provision of this Agreement may be changed or waived except by a written amendment signed by a signing officer of each party.

15. **Severability** – If any provision of this Agreement is declared by a court of competent jurisdiction to be invalid, illegal or unenforceable, such provision shall be severed from the Agreement and the other provisions shall remain in full force and effect.

DX:50310998.3

Appendix 1

1. CIRA will, for the duration of the ENUM Trial, act as the Tier 1A Registry and operate the authoritative nameservers and zone files for 1.e164.arpa and as such CIRA will provide the following services in accordance with the Agreement:

   a) Publish the DNS zone 1.e164.arpa, delegating authority for its subdomains to the appropriate Tier 1B nameserver(s) as provided by ENUM LLC.

   b) Maintain at least two nameservers for the purpose of supporting 1 (a) of this Schedule 1.

2. a) Commercial and retail end users shall not be a part of the ENUM Trial; and

   b) Stress testing and performance testing shall not be part of the ENUM Trial.

3. General

   f) CIRA will not activate a Number Planning Area. (an "NPA") into the ENUM Trial without the written instructions from ENUM LLC to CIRA that ENUM LLC has obtained proper permission of the government responsible for that NPA.

   g) Each ENUM Trial Participant will be assigned a temporary password which shall be sent by CIRA to the email address as provided by ENUM LLC for each Participant to CIRA.

   h) Upon confirmation and agreement by the ENUM Trial Participant to CIRA's terms and conditions, CIRA shall issue a permanent password and user ID to the ENUM Trial Participant to participate in the ENUM Trial.

   i) The ENUM Trial is limited to assigned geographic NPAs in the North American Numbering Plan.(the "NANP") serving area only, as defined in the Industry Numbering Committee (INC) NPA Allocation Plan and Assignment Guidelines that are assigned to the ENUM Trial.

   j) The results of the ENUM Trial may be used by the ENUM LLC to refine the CC1 ENUM technical requirements.

DC:503109983

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EXHIBIT 7

DEC ~ I 2005

Mr. Houlin Zhao
Director of the Telecommunication Standardization Bureau
International Telecommunication Union
Place des Nations
CH-1211 Geneva 20
Switzerland

Dear Director Zhao,

On behalf of the United States of America, we request the delegation of
1.e164.arpa (that is, the ENUM domain name corresponding to E.164
Country Code 1) to the name servers identified in the attached template (i.e.,
name servers "ns01.enum-1a.ca" and "ns02.enum-1a.ca"). This template has
been sent to RIPE NCC.

We request this delegation in order to permit a technical trial of the use of
the ENUM domain name. The trial will last no longer than one year
following the delegation. For the purposes of the trial, we will utilize
existing U.S. numbering resources.

Also attached is a letter from the CC1 ENUM LLC, which will have
administrative responsibility for the trial. The letter states the terms and
conditions under which CC1 ENUM LLC has agreed with the TSB to
conduct the trial.

Sincerely,

Ambassador David A. Gross
U.S. Coordinator,
International Communications and Information Policy

enum-template-2005-11-02.txt

Domain Object

```
domain:          1.e164.arpa.
descr:           North American ENUM Mapping
admin-c:         JB4892-RIPE
tech-c:          CER4-RIPE
zone-c:          CER4-RIPE
nserver:         ns01.enum-la.ca
nserver:         ns02.enum-la.ca
mnt-by:          MP8466-MNT
mnt-lower:       MP8466-MNT
changed:         matt.pounsett@cira.ca 20051101
source:          RIPE
```

Admin Contact

```
person:          James Baskin
address:         CC1 ENUM LLC
address:         c/o McKenna Long and Aldridge LLP
address:         1875 Lawrence St, Suite 200
address:         Denver, CO 80202
fax-no:          +1 425 963 5445
phone:           +1 973 783 5873
e-mail:          baskin@enumllc.com
nic-hdl:         JB4892-RIPE
mnt-by:          MP8466-MNT
source:          RIPE
```

Zone/Tech Contact

```
role:            CIRA ENUM Registry
address:         CIRA ENUM Registry
address:         350 Sparks Street, Suite 1110
address:         Ottawa, Ontario, Canada
address:         K1R 7S8
phone:           +1 613 237 5335
fax-no:          +1 613 237 0534
e-mail:          admin-enum@cira.ca
admin-c:         MP8466-RIPE
tech-c:          MP8466-RIPE
nic-hdl:         CER4-RIPE
mnt-by:          MP8466-MNT
source:          RIPE
```

Maintainer

```
mntner:          MP8466-MNT
descr:           Maintainer for Matthew Pounsett
```

```
                      enum-template-2005-11-02.txt
admin-c:             MP8466-RIPE
tech-c:              MP8466-RIPE
auth:                PGPKEY-F8DB0BCB
mnt-by:              MP8466-MNT
referral-by:         MP8466-MNT
source:              RIPE
```

CC1 ENUM LLC

Country Code 1 ENUM Limited Liability Company

C/o McKenna Long and Aldridge LLP
1875 Lawrence St, Suite 200
Denver CO 80202

Karen N. Mulberry
Chairman, CC1 ENUM LLC
C/o MCI Communications
Office: +1.972.729.7914
Wireless: +1.972.896.8686
Fax: +1.425.963.5445
Pager: +1.800.664.2965
Email: karen.mulberry@mci.com

November 30, 2005

Mr. Zhao Houlin
Director - International Telecommunications Union (ITU)
Telecommunication Standardization Bureau (TSB)
Place des Nations
CH 1211 Geneva 20
Switzerland

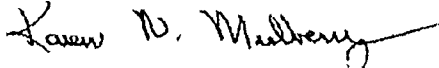Subject: ITU / CC1 ENUM LLC Agreement

Dear Mr Zhao,

The following constitutes our agreement with the ITU-T TSB as identified in the Ad-Interim guidelines.

1. The CC1 ENUM LLC commits to honor objections and approvals submitted by TSB on behalf of member states. That is, ENUM temporary delegations for the purpose of CC1 ENUM trials will not be implemented if there is an objection by TSB, and any approvals granted by TSB can be revoked at any time, at the request of the concerned Member State for its portions of the code.
2. Should TSB fail to reply within 30 days to a request sent by the CC1 ENUM LLC to TSB, then the CC1 ENUM LLC will contact TSB to enquire regarding the reasons for the lack of response. The CC1 ENUM LLC will make every effort to obtain a response from TSB within 60 days.

If you have any questions or concerns, please contact me as the Chairman of the CC1 ENUM LLC at +1-972-896-8686 or the Vice-Chairman, James Baskin at +1-973-783-5873.

I would appreciate your confirming by return letter that you accept this agreement.

Sincerely,

Karen N. Mulberry
Chairman, CC1 ENUM LLC

CC:
CC1 ENUM LLC Membership
Allan MacGillivray, Industry Canada
Thierry Husson, Industry Canada
Stephen Delaney, CRTC
Stacy Cheney, NTIA
Cathy Handley, NTIA
Sanford Williams, FCC
Jamie Ennis, Department of State
Lisa Hone, FTC

EXHIBIT 8

DEC 1 4 2005

Mr. Houlin Zhao
Director
Telecommunication Standardization Bureau
International Telecommunication Union
Place des Nations
CH-1211 Geneva 20
SWITZERLAND

Dear Mr. Zhao:

Canada is an active player in public ENUM deployment and I am writing to confirm that Canada supports a temporary delegation of Country Code 1 (CC1) ENUM Domain "1.e164.arpa" to the designated name servers identified in the attached letter, pursuant to the ITU interim procedures.

The temporary delegation is for the purpose of technical trials of the ENUM domain name and is to end no later than 365 days following the confirmation date of the delegation by RIPE NCC, in accordance with the attached agreement dated November 30, 2005, between the Telecommunication Standardization Bureau and the CC1 ENUM LLC. The activation of any Canadian Number Plan Areas (NPA) and Canadian numbers for the purpose of conducting an ENUM trial will require a written authorization of the Canadian government authority. At the present time, there is no such authorization.

As the administrator for the Canadian portion of the North American Numbering Plan resources (CC1), the Government of Canada may reconsider its support should Canada's interests so require.

Sincerely,

Michael Binder
Assistant Deputy Minister
Spectrum, Information Technologies
and Telecommunications

Attachment

c.c. Mr. Charles M. Dalfen, CRTC

Canada

Domain Object

```
domain:          1.e164.arpa.
descr:           North American ENUM Mapping
admin-c:         JB4892-RIPE
tech-c:          CER4-RIPE
zone-c:          CER4-RIPE
nserver:         ns01.enum-la.ca
nserver:         ns02.enum-la.ca
mnt-by:          MP8466-MNT
mnt-lower:       MP8466-MNT
changed:         matt.pounsett@cira.ca 20051101
source:          RIPE
```

Admin Contact

```
person:          James Baskin
address:         CC1 ENUM LLC
address:         c/o McKenna Long and Aldridge LLP
address:         1875 Lawrence St, Suite 200
address:         Denver, CO 80202
fax-no:          +1 425 963 5445
phone:           +1 973 783 5873
e-mail:          baskin@enumllc.com
nic-hdl:         JB4892-RIPE
mnt-by:          MP8466-MNT
source:          RIPE
```

Zone/Tech Contact

```
role:            CIRA ENUM Registry
address:         CIRA ENUM Registry
address:         350 Sparks Street, Suite 1110
address:         Ottawa, Ontario, Canada
address:         K1R 7S8
phone:           +1 613 237 5335
fax-no:          +1 613 237 0534
e-mail:          admin-enum@cira.ca
admin-c:         MP8466-RIPE
tech-c:          MP8466-RIPE
nic-hdl:         CER4-RIPE
mnt-by:          MP8466-MNT
source:          RIPE
```

Maintainer

```
mntner:          MP8466-MNT
descr:           Maintainer for Matthew Pounsett
```

enum-template-2005-11-02.txt

```
admin-c:       MP8466-RIPE
tech-c:        MP8466-RIPE
auth:          PGPKEY-F8DB0BCB
mnt-by:        MP8466-MNT
referral-by:   MP8466-MNT
source:        RIPE
```

CC1 ENUM LLC

Country Code 1 ENUM Limited Liability Company

C/o McKenna Long and Aldridge LLP
1875 Lawrence St, Suite 200
Denver CO 80202

Karen N. Mulberry
Chairman, CC1 ENUM LLC
C/o MCI Communications
Office: +1.972.729.7914
Wireless: +1.972.896.8686
Fax: +1.425.963.5445
Pager: +1.800.664.2965
Email: karen.mulberry@mci.com

November 30, 2005

Mr. Zhao Houlin
Director - International Telecommunications Union (ITU)
Telecommunication Standardization Bureau (TSB)
Place des Nations
CH 1211 Geneva 20
Switzerland

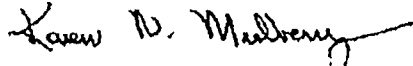Subject: ITU / CC1 ENUM LLC Agreement

Dear Mr Zhao,

The following constitutes our agreement with the ITU-T TSB as identified in the Ad-Interim guidelines.

1. The CC1 ENUM LLC commits to honor objections and approvals submitted by TSB on behalf of member states. That is, ENUM temporary delegations for the purpose of CC1 ENUM trials will not be implemented if there is an objection by TSB, and any approvals granted by TSB can be revoked at any time, at the request of the concerned Member State for its portions of the code.
2. Should TSB fail to reply within 30 days to a request sent by the CC1 ENUM LLC to TSB, then the CC1 ENUM LLC will contact TSB to enquire regarding the reasons for the lack of response. The CC1 ENUM LLC will make every effort to obtain a response from TSB within 60 days.

If you have any questions or concerns, please contact me as the Chairman of the CC1 ENUM LLC at +1-972-896-8686 or the Vice-Chairman, James Baskin at +1-973-783-5873.

I would appreciate your confirming by return letter that you accept this agreement.

Sincerely,

Karen N. Mulberry
Chairman, CC1 ENUM LLC

CC:
CC1 ENUM LLC Membership
Allan MacGillivray, Industry Canada
Thierry Husson, Industry Canada
Stephen Delaney, CRTC
Stacy Cheney, NTIA
Cathy Handley, NTIA
Sanford Williams, FCC
Jamie Ennis, Department of State
Lisa Hone, FTC

EXHIBIT 9

MEMORANDUM OF UNDERSTANDING
FOR AN ENUM TRIAL IN THE UNITED STATES

PREAMBLE

This is a Memorandum of Understanding ("MoU") by and between the Country Code 1 ENUM Limited Liability Company ("ENUMLLC") and entities who wish to participate ("Participants") in a public trial of ENUM in the United States under the 1.e164.arpa domain (the "U.S. Trial").

This MoU reflects the common agreement of ENUMLLC and the Participants (collectively, the "Parties") and the terms according to which they will cooperate in the conduct of the U.S. Trial.

RECITALS

Whereas, ENUM, as set forth in Internet Engineering Task Force (IETF) RFC 3761, specifies an open standards track protocol for the Internet community on how the DNS can be used for identifying available services connected in relation to a domain name and a corresponding E.164 number; and

Whereas, discussions are taking place internationally in preparation for the launch of ENUM services in the future; and

Whereas, the aim of the U.S. Trial is to test the architectural, technical, operational and user aspects related to provision of ENUM capabilities, as defined in IETF RFC 3761, for the U.S. under Country Code 1; and

Whereas, it is anticipated, but not warranted or guaranteed, that the U.S. Trial could provide valuable experience, data and information concerning the implementation of the ENUM protocol; and

Whereas, ENUMLLC intends, with the assistance of the Participants as outlined herein, to report results from the U.S. Trial to relevant authorities and to the public in order to assist parties interested in learning about ENUM, including commercial implementation of ENUM capabilities;

AGREEMENT

Now, therefore, the Parties hereby voluntarily agree to cooperate, according to their selected roles, as follows in the implementation of the U.S. Trial:

A.   General Principals Governing U.S. Trial. The Parties agree that U.S. Trial will be governed by the following general principals:

1.   ENUMLLC will manage and direct the U.S. Trial in accordance with all applicable law(s), statute(s), regulation(s), and other applicable authority(ies).

2.   Participation in the U.S. Trial is open to all persons or entities interested in gaining experience with the implementation and use of ENUM capabilities and ENUM-

enabled services and willing to execute this MoU prior to commencement of the U.S. Trial. Notwithstanding the foregoing, ENUMLLC reserves the right to terminate or suspend the participation of any person(s) or entity(ies) if, in ENUMLLC's sole discretion, a) that person or entity is failing or has failed to comply with this MoU, and/or b) such termination or suspension is in the best interests of the U.S. Trial as a whole.

3.   The U.S. Trial will be implemented by using, to the greatest extent practicable, open and standardized protocols and interfaces in order to facilitate interoperability between the Parties.

4.   The U.S. Trial is intended to test the architectural, technical, operational and user features of ENUM capabilities and ENUM-enabled services in a manner that will not harm current technical and functional operations of the PSTN or the Internet.

5.   The U.S. Trial is intended to facilitate planning by ENUMLLC, USTC, and other interested parties for the technical and commercial implementation of the ENUM protocol in a manner that will enhance the stability of ENUM-enabled services after commercial implementation.

6.   The U.S. Trial is intended to further commercial implementation of the ENUM protocol in a manner that promotes market competition and consumer choice. The Parties recognize that such competition may lower costs, promote innovation, and enhance user choice and satisfaction.

7.   The U.S. Trial is intended to further commercial implementation of the ENUM protocol in a manner that minimizes barriers to entering any current or future market(s) for the commercial provision of ENUM-enabled services, with the goal of encouraging entry by new entities and increasing competition and growth, to the benefit of all industry players and consumers.

8.   Participants must not expect any financial benefits or compensation for their participation in and support of the U.S. Trial. Notwithstanding the foregoing, Participants are not precluded from using the knowledge and experience gained during the U.S. Trial to foster commercial benefit for themselves, subject to the restrictions set out in this MoU.

9.   Participation in the U.S. Trial will not advantage (or disadvantage) Participants who elect to respond to any request for proposals or tender that may be issued with respect to commercial implementation of ENUM.

10.   The U.S. Trial is intended to test procedures and models related to the ENUM protocol. It is anticipated that some of the procedures and models tested during the U.S. Trial will not be successful. The failure or success of any particular component of the U.S. Trial – e.g., DNS hosting or a particular registry/registrar model – should not necessarily advantage (or disadvantage) the Participants testing that component of the U.S. Trial.

B. Objectives of U.S. Trial. The Parties agree that the high level objectives of the U.S. Trial are as follows:

1. To evaluate the pros and cons of the current preferred architecture developed by ENUMLLC and its Technical Advisory Committee (TAC) for implementation of ENUM capabilities, with particular emphasis on demonstration of the Registry and Registrar functions;

2. To evaluate the processes, interfaces, and protocols for the interactions between seven functional categories involved in implementation and use of ENUM-enabled services, which include Tier1 Registry, ENUM Registrar, ENUM Tier 2 Name Service Provider, Telecommunication Service Provider, Application Service Provider, Authentication Agency, and ENUM Users (the "Functional Categories").

3. To determine technical and operational requirements to provisioning ENUM records at Tier 1 and Tier 2 levels;

4. To assess DNS requirements and implications in the provision of ENUM-enabled services;

5. To determine security and verification requirements for provisioning and operation of ENUM-enabled services;

6. To test from technical and user perspectives applications that employ or rely on the use of ENUM capabilities; and

7. To allow Participants and interested parties to assess the economic benefits and costs of supporting ENUM services.

8. To prepare a report of the U.S. Trial for distribution to all relevant authorities and to the public.

C. Responsibilities of Parties. The Parties accept the respective responsibilities outlined below. The Parties agree to fulfill their respective responsibilities in conducting the U.S. Trial.

1. *ENUMLLC* will direct and monitor the U.S. Trial.

2. *ENUMLLC* will contract with a Project Executive who will assist ENUMLLC in overseeing the conduct of the U.S. Trial. ENUMLLC will bear the costs of the contract with the Project Executive.

3. *ENUMLLC* will apply to the Federal Communications Commission for assignment of numbers from geographic Number Plan Areas in the U.S. for use in the U.S. Trial, and will manage any numbering resources assigned.

4. *ENUMLLC* will determine the length of the U.S. Trial. The U.S. Trial shall comprise three phases: Phase 1 – Registry Infrastructure; Phase 2 – Registry/Registrar Interface; Phase 3 –Application Testing. The combined length of these

three phases shall not exceed the length of the temporary delegation of numbering resources necessary for the conduct of the U.S. Trial.

5.   *ENUMLLC*, with assistance and input from Participants, will develop a Trial Plan that outlines the procedures to be followed in conducting each phase the U.S. Trial. The Trial Plan will identify the data and documentation to be generated in conjunction with or as a result of the testing procedures (the "Trial Materials"). It is anticipated that the Trial Materials will include all documents, data, technical specifications and models, and other specifications and models, and other contributions or outputs generated during the U.S. Trial Trial Materials will not include Participants' confidential and/or proprietary business information, personal data provided by users and entered into the DNS and/or registry/registrar systems or other proprietary information used or generated during the U.S. Trial.

6.   *Participants* will comply with the Trial Plan, and will make all Trial Materials available to one another and to ENUMLLC for the purpose of drafting and finalizing a report of the U.S. Trial. Participants may also engage in other testing activities, provided that such activities do not in any way disrupt the Trial Plan or alter the results of the Trial Plan. Participants will not be required to account to one another or to ENUMLLC for the results of such additional testing activities.

7.   *Participants* will comply with the number administration and use procedures developed by *ENUMLLC* to incorporate the terms of any waiver pursuant to which the Federal Communications Commission grants use of numbering resources for the U.S. Trial

8.   Where feasible, the *Parties* will make decisions regarding the U.S. Trial by consensus. When, in the judgment of the *Project Executive*, consensus regarding one or more decisions cannot be reached in a timely fashion, the Project Executive will refer the decision(s) to *ENUMLLC* for final resolution.

9.   The *Parties* will act in a transparent, non-arbitrary and reasonable manner in the conduct of the U.S. Trial.

10.   Each *Participant* will designate one primary and up to two alternate individual representatives who will sit on a Trial Participants' Advisory Committee and will serve as the point of contact between the Participant, and ENUMLLC, the Project Executive, and all other Participants in the U.S. Trial. The Trial Participants' Advisory Committee will meet weekly by conference call. Communications or notice of any kind directed to the Participant's representative will be considered to have been directed to the Participant. In the event that the Participant's representative is unavailable, the Participant will be solely responsible for arranging for an alternate representative to attend Trial Participants' Advisory Committee meetings and to receive communications from ENUMLLC, the Project Executive, and other Participants.

11.   *Participants* will each bear all of their own costs and expenses of participating in the Trial. Neither compensation nor financial benefits are foreseen for any Participant in the conduct of the U.S. Trial.

12.   *Participants* will cooperate with the Project Executive, with ENUMLLC, and with one another in the conduct of the U.S. Trial and in the drafting of the report of the U.S. Trial.

13.   *Participants* commit to remain actively involved for the full duration of the U.S. Trial and the time required to draft a report of the U.S. Trial, subject to the approval of ENUMLLC, and will use reasonable best efforts to ensure the success of the U.S. Trial. Participants agree that sustained active involvement by each Participant, which includes but is not limited to regular attendance at meetings of Participants and contribution to reporting the results of the U.S. Trial, are prerequisites to such success.

14.   *Participants'* trial activities must be limited in scope to one or more of the Functional Categories involved in implementation and use of ENUM-enabled services. Participants will identify the Functional Category(ies) in which they will operate for the duration of the U.S. Trial at the time of executing this MoU.

15.   The *Parties* will endeavor to recruit a sufficient number of Participants in each of the Functional Categories to ensure the success of the U.S. Trial. *ENUMLLC* may permit additional Participants to join the U.S. Trial after the trial commences if, in the sole discretion of ENUMLLC, adding a new Participant to the particular Functional Category(ies) in which the prospective participant is interested will be reasonably feasible and useful to the U.S. Trial as a whole. No prospective participant will be permitted to join the U.S. Trial at any time unless that prospective participant first executes this MoU.

16.   *Participants* will use reasonable best efforts to ensure the continuity of the U.S. Trial. In the event that any Participant is prevented or prohibited from completing the U.S. Trial for any reason, that Participant will, at the direction of *ENUMLLC*, transfer all Trial Materials in that Participant's possession to another Participant or Participants to be designated by ENUMLLC.

17.   At the completion of the U.S. Trial, *Participants*, under the direction of the *Project Executive*, will produce a draft report for the approval of *ENUMLLC*. Each Participant will contribute to the drafting of the report, and each Participant will be required to contribute Trial Materials to the report pursuant to the Trial Plan.

18.   *ENUMLLC* will finalize the report of the U.S. Trial and will ensure that it is distributed to relevant authorities and to the public. The final report will contain an express waiver of any representations or warranties regarding the accuracy, completeness, or fitness for particular purposes of the contents.

D.   Legal Considerations

1.   Participation in the U.S. Trial confers neither membership nor rights to membership of any kind in ENUMLLC.

2.   It is understood that the U.S. Trial is intended to be a process for testing and experimentation, the results of which are unknown and cannot be guaranteed.

Consequently, **ENUMLLC MAKES NO REPRESENTATIONS OR WARRANTIES EXPRESS OR IMPLIED OF ANY KIND WHATSOEVER REGARDING THE U.S. TRIAL, INCLUDING BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS OR FITNESS FOR ANY PURPOSE OF ANY TRIAL PLANS, TRIAL MATERIALS, OR REPORTS OF THE U.S. TRIAL. PARTICIPANTS AGREE THAT ENUMLLC SHALL NOT BE LIABLE FOR ANY COST, LOSS, DAMAGE (INCLUDING INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES) OR EXPENSE OF ANY KIND CAUSED DIRECTLY OR INDIRECTLY BY PARTICIPANT'S INVOLVEMENT IN THE U.S. TRIAL. PARTICIPANT'S INVOLVEMENT IN THE U.S. TRIAL IS UNDERTAKEN AT THE PARTICIPANT'S SOLE RISK.**

PARTICIPANT MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, OF ANY KIND WHATSOEVER REGARDING ITS PARTICIPATION IN THE U.S. TRIAL, INCLUDING BY NOT LIMITED TO THE ACCURACY, COMPLETENESS, OR FITNESS FOR ANY PURPOSE OF ANY TRIAL MATERIALS. PARTICIPANT SHALL NOT BE LIABLE TO ENUMLLC OR TO ANY OTHER PARTICIPANT FOR ANY COST, LOSS, DAMAGE (INCLUDING INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES) OR EXPENSE OF ANY KIND CAUSED DIRECTLY OR INDIRECTLY BY PARTICIPANT'S INVOLVEMENT IN THE U.S. TRIAL.

4.   The Trial Plan, Trial Materials and draft and final reports of the U.S. Trial, will be the sole property of ENUMLLC such that ENUMLLC shall be the author thereof and shall have all copyright rights and other rights or ownership arising from authorship, including, without limitation, all rights to publish, distribute, copy, adapt, modify or alter such materials, including adaptation of such materials into different formats for different contexts (e.g. CD-Rom, portable document format, etc.) It is the intent of ENUMLLC to make such materials freely available to the Participants, to governmental authorities, and to interested parties. In addition, ENUMLLC will post the final report of the U.S. Trial for public view at the following web site: _____]

5.   The U.S. Trial will be conducted in accordance with applicable data privacy and protection laws. At the end of the U.S. Trial, any personal data used during the Trial will be destroyed in accordance with relevant U.S. law on data privacy and protection. Data made available for the U.S. Trial will not be used for any form of junk communication, mass marketing or unfair trade practice.

6.   It is the clear and unequivocal policy of ENUMLLC and the Participants, that the U.S. Trial will comply in all respects with the relevant competition and antitrust rules.

7.   ENUMLLC and the Participants will not take part in any practice that would have the object or effect of restricting competition in the communications or DNS industries, nor will they provide a forum to promote anti-competitive conduct. Participants will not become involved in the competitive business decisions of one another by cooperating in the U.S. Trial.

8.   U.S. Trial activities shall not involve discussions or agreements (including oral or informal agreements, decisions, and recommendations, whether binding or not) relating to restrictive practices, including:

- Participants shall not agree between themselves pricing and other terms and conditions of sale, including common prices and pricing policy, resale prices, price changes, discounts, rebates, price elements, profit margins, recommended or target prices, and credit terms. Nor shall they indirectly restrict price competition by rigged bidding.

- Participants shall not agree to share markets between themselves, in particular by the division of territories or customers.

- Participants shall not exchange individualized up-to-date commercial information, particularly with regard to prices, discounts, costs, investments, output or sales, capacities, customers or market shares.

9.   Any Participant may terminate its participation in this MoU and the U.S. Trial upon thirty (30) days' written notice to ENUMLLC. In the event that a Participant elects such termination before the close of the U.S. Trial, Participant may retain Trial Materials in its possession, provided that:

- Participant agrees to maintain the confidentiality of the Trial Materials until such time, if any, that ENUMLLC is prepared to release the Trial Materials publicly,

- Participant agrees that until such time, if any, that ENUMLLC releases the Trial Materials publicly, Participant may not, without prior written approval from ENUMLLC, distribute the Trial Materials to individuals or entities other than Participant,

- Participant agrees that until such time, if any, that ENUMLLC releases the Trial Materials publicly, Participant may not, without prior written approval from ENUMLLC, use the Trial Materials for any purpose other than Participant's internal use, and

- Notwithstanding the foregoing, Participant agrees to comply with the data destruction obligations set forth in Paragraph D(5) above at the earliest possible time that such destruction can occur without disruption to the U.S. Trial, as determined by ENUMLLC. Participant further agrees to certify such destruction to ENUMLLC.

10.   This MoU may be amended, modified, or extended by the ENUM LLC upon 30-days written notice, or sooner upon the written agreement of all Parties.

11.   Disputes arising under or resulting from this MoU shall be governed by Delaware law, without regard to conflict of laws principles. The parties irrevocably consent to exclusive jurisdiction of the state and federal courts in the State of Delaware. Process shall be deemed sufficient if served on either party by courier service or

recognized mail delivery service (e.g. U.S. Mail), postage prepaid, certified or registered, return receipt requested. The parties hereby waive any objection as to the sufficiency of the method of service, if service is made as set forth herein.

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SEEN AND AGREED:

COUNTRY CODE 1 ENUM LLC

By (signature): _____

Name (print): _____

Title: _____

Date: _____

PARTICIPANT NAME: _____

By (signature): _____

Name (print): _____

Title: _____

Date: _____

PRIMARY PARTICIPANT REPRESENTATIVE

Name: _____

Title: _____

Telephone: _____

Fax: _____

Electronic mail:_____

ALTERNATE REPRESENTATIVE #1

Name: _____

Title: _____

Telephone: _____

Fax:_____

Electronic mail:_____

ALTERNATE REPRESENTATIVE #2

Name: _____

Title: _____

Telephone: _____

Fax: _____

Electronic mail:_____

PARTICIPANT'S SELECTION OF FUNCTIONAL CATEGORY(IES)

_____	Tier1 Registry
_____	ENUM Registrar
_____	ENUM Tier 2 Name Service Provider
_____	Telecommunication Service Provider
_____	Application Service Provider
_____	Authentication Agency
_____	ENUM User

EXHIBIT 10

UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

The Honorable David A. Gross
U.S. Coordinator for International Communications
and Information Policy
Department of State
2201 C Street, N.W.
Washington, DC 20520

Dear Ambassador Gross:

The convergence of telecommunications and computing technologies is once again presenting the Unit
States with an important decision that will impact how our nation will maintain its world leadership in
technology policy. We currently have the opportunity to participate or "opt in" to the new global doma
set aside for electronic numbering (ENUM), e164.arpa. Because of the potential benefits of ENUM, the
Department of Commerce through the National Telecommunications and Information Administration
(NTIA) believes that the United States should seize this opportunity and take steps to participate in
e164.arpa, consistent with the highest standards of security, competition, and privacy.

As a mapping protocol that links the Internet and telephony platforms through a single identifier, ENU]
has the potential to facilitate convergence of communications networks by linking e-mail addresses,
telephone numbers, fax numbers, and cell phone numbers for individuals or businesses. To date, thirtee
International Telecommunication Union (ITU) member nations, including the United Kingdom, have
opted into e164.arpa and are beginning to establish trials to provide ENUM services. The United States
has been supportive of ITU work in this area, recognizing that using ENUM through a globally
coordinated domain may provide efficiencies and opportunities for global interconnectivity that could
benefit both industry and users. As you recall, during the September 2001 Study Group 2 meeting, the
United States expressed our support for the ITU's work regarding RFC 2916, the proposed standard for
ENUM, which designates e164.arpa as the top-level domain of the ENUM tree.

While NTIA recommends that the State Department continue to support work at the ITU to reach
conclusion on the ENUM Recommendations and Supplement, the time has come for the United States
be more active on this issue. Specifically, the United States should move quickly to address certain key
preliminary issues regarding U.S. implementation of ENUM and, if resolved satisfactorily, then formal
opt in to e164.arpa.

On the domestic side, we must ensure that ENUM can be implemented in a pro-consumer, secure, and
competitive manner. In August 2002, NTIA held a forum on ENUM at which industry and non-profit
entities discussed the various benefits and challenges of this new technology. There was strong
consensus among the forum participants in favor of the United States opting in to e164.arpa, but only i
ENUM can be implemented in a way that ensures competition, interoperability, security, and privacy.

Keeping this view in mind, we have developed principles to guide domestic implementation of ENUM. The following principles have strong roots in proven telecommunications and technology policies and are intended to maximize opportunities for industry, while protecting the security and privacy of consumers in the United States:

- **Preserve national sovereignty:** Any participation by the United States in a coordinated, global approach must preserve the United States' national sovereignty. That is, the United States and every other participating nation should have the right to determine whether and in what manner ENUM or any alternative is implemented domestically.

- **Support competition:** Domestic implementation of ENUM must also allow for competition among providers and operators on as many levels as feasible.

- **Promote innovation:** Adoption of ENUM or ENUM alternatives must encourage innovation and promote advanced voice and data services through new products, services, and vendors.

- **Protect users' security and privacy:** Domestic implementation of ENUM must be done in a manner that maximizes the privacy and security of user data entered in the ENUM DNS domain. For example, ENUM providers should develop systems to ensure the authentication and authorization of users who enter and update their personal information.

- **Minimize regulation:** Governance of ENUM on the international and national level must be accomplished through the least regulatory means possible. For example, a coordinated, global approach to ENUM should not give rise to a new regulatory apparatus to govern international and domestic implementation.

- **Preserve opportunity for alternative deployments:** The implementation of ENUM within the United States must not preclude alternative deployments of ENUM or other solutions that may provide competitive alternatives to ENUM.

- **Allow for interoperability:** In order to support competition and the emergence of alternative technologies and networks, the implementation of ENUM within the United States should accommodate alternative deployments' interconnection with the ENUM tree.

- **Preserve stability and security:** Any implementation of ENUM must not diminish the stability and security of the Internet or telecommunications systems.

Before opting in to e164.arpa, we must ensure that ENUM can be implemented domestically in a mann consistent with the above principles. These factors also should play a role in the selection of Tier 1 operator(s). NTIA is committed to working with the Department of State and the relevant agencies, suc as the Federal Communications Commission (FCC), to ensure that ENUM can be implemented in this manner.

Internationally, the ITU procedures to opt in require that each Member State enter its specific country code (or portion of a country code) into the ENUM tree. The United States will need to determine how best to coordinate this process with the nineteen nations in Country Code 1. Once these implementation issues are resolved, the Department of State would make any necessary notifications regarding the United States' decision to opt in. Industry can then establish trials and begin to provide ENUM services to U.S. businesses and consumers.

NTIA is committed to working diligently to resolve these implementation issues with the FCC and the Department of State. These three agencies are beginning a series of meetings to establish processes to determine how to resolve both the domestic and international questions. I look forward to working with you and Chairman Powell to ensure a successful multilateral and domestic review of ENUM so that we can soon begin to reap the benefits of ENUM within the United States.

                        Sincerely,

                        Nancy J. Victory

cc: Chairman Michael K. Powell

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EXHIBIT 11

CC1 U.S. ENUM Trial Block Allocation & Number Administration Procedures

Introduction

In the *Terms and Conditions for a U.S. Trial of ENUM* provided in Ambassador Gross' letter of September 2, 2005, conditions 4 and 5 speak to the numbering resources to be used in the trial:

4.   Prior to the commencement of the trial, the ENUM LLC must apply to the Federal Communications Commission (FCC) for approval of an assignment of numbers from geographic Numbering Plan Area's (NPA's) in the U.S., for use in the U.S. ENUM trial. These numbers may be distributed appropriately to U.S. trial participants, but not to end users or consumers not affiliated with the trial participants. For example, trial participants may allow their employees to use the numbers on a temporary basis only. Use of any other U.S. numbers in this trial is prohibited.

5.   The ENUM LLC is only permitted to apply for or use geographic numbers which have been approved by the FCC for the U.S. ENUM trial. Use of non-geographic numbers in this trial is prohibited.

Numbering Scenario

Based on the above conditions and subsequent discussions, the LLC proposes the following scenario for trial number assignment:

- The LLC will request pursuant to condition 4 above that the FCC direct the Pooling Administrator (PA) to assign at the direction of the LLC some maximum number of new thousands blocks (NPA-NXX-Xs) from codes already opened in the PSTN for use in the trial.
- The request will stipulate that blocks will only be requested as needed to accommodate new participating carriers and/or rate centers.
- The LLC will then make a request to the PA assign blocks within the allocation to specific service providers for use in the trial.
- The service providers will then request the corresponding blocks from the PA using current methods and procedures except that assignment will be exempted from the normal utilization thresholding since they are for trial use.
- Service providers will provision the blocks in their networks but restrict number assignments from the blocks to bona fide trial participants that the LLC has verified have signed the trial MOU agreeing to the USG's terms and conditions. Service providers will report assignments to the LLC.
- The trial MOU will stipulate that trial participants will not assign trial numbers to non trial participants such as their customers, tenants, or students.
- To optimize use of numbering resources, the LLC working through participating carriers, may in some instances assign individual numbers from trial blocks associated with a rate centers other than that in which the participant is located. The PSTN point of interface for the block will always be appropriate to the rate center with the block is associated.

- As additional participants/locations join the trial, the LLC will request new block assignments from the PA not to exceed the total allocation ordered by the FCC.
- Registrars and the Tier 1B Registry will likewise be bound to accept registrations only for numbers in the thousands blocks allocated for the trial.
- On a monthly basis the LLC will report to the FCC the current set of block allocations and number assignments in use in the trial.

Procedures for Block Allocation

1. The Trial Participants Advisory Committee (TPAC), consisting of participants that have signed the trial MoU committing to observe all of the terms and conditions set forth by the USG, will determine the rate centers in which numbering resources are required and the participating carriers that agree host the corresponding blocks.
2. The LLC will review the TPAC's recommendation and, upon approval send a request to the PA. The request will include a copy of the FCC waiver under which the blocks are being requested and list the rate centers and associated host carriers to which the blocks are to be assigned. At the same time, a copy of the request will be sent to the FCC.
3. The host carriers will submit applications as normally but noting that the applications are trial blocks pursuant to the waiver and provide a copy of the LLC's request.

Procedures for Number Assignment

1. Once blocks have been assigned by the PA, participating carriers will implement them in their networks under normal procedures but will make no number assignments from them.
2. Trial participants will request numbers for use in the trial from the TPAC. The request form will require indication of where the number will be assigned (e.g., lab, employee office, etc.) and certification that the number will not be assigned to an end user.
3. After review the TPAC will forward the request to the appropriate participating carrier, indicating the trial block from which the number should be assigned.
4. The host carrier will assign numbers and notify the trial participant, TPAC, and LLC of the assignment made.
5. The LLC will include the number assignments made in its monthly report to the FCC.

Procedures for Return of Blocks

At the end of the trial the LLC will contact the PA and indicate that the blocks assigned are to be returned and provide a corresponding list. The participating carriers will assist as necessary in the return process. The PA will notify the LLC and FCC once the blocks have been returned.